Forest Resources and Technologies (FOREST) Project

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Final Report

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Submitted by
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I. Introduction

Winrock International, in partnership with Chemonics and the Heron Group, was awarded the Forest Resources and Technology (FOREST) Project on July 21, 2000. This five-year project was based in Khabarovsk, Russia and was implemented July 2000 - July 2005 in the Russia Far East and Siberia. Initially the major goals of the project were to reduce the threat of global climate change and preserve biodiversity by promoting sustainable forest management and preserving Russian forests as a globally important carbon sink and critical habitat for rare and endangered species. The project adapted to a changing environment and the goal shifted to improving economic development through improving natural resource management.

The FOREST project achieved the goal by focusing on four technical components: forest fire prevention, pest management, non-timber forest products and secondary wood processing, and renewable energy alternatives. In addition to the four primary components, three crosscutting components (forest policy and legal reform; applied forestry research; and a grant/loan program) supported the technical components. The program worked in five main regions - Khabarovsk, Sakhalin, Primorye, Irkutsk, and Krasnoyarsk. By the end of the project, activities extended to Khakhassia, Tomsk and several programs were adopted at the Federal Level.

USAID designed this project in collaboration with their partners and the Ministry of Natural Resources through a participatory process to build and expand on efforts supported by USAID in the past. FOREST collaborated with key organizations, built the capacity of local individuals, organizations, institutions, associations and private companies. The project approach was to start activities in specific areas, develop sound approaches, then spread the approach to other areas, and finally bring the approach to the national level. The project's interventions included seminars, workshops, trainings, paid and volunteer Russian and US consultants, grants, study tours and tradeshows. The project first conducted assessments to identify the key areas of intervention and then provided appropriate assistance based on the research. Research was key to identify how FOREST could effectively and efficiently make a difference. Unlike most USAID programs, this program worked with a combination of government institutions, research institutions, civil society organizations, the media, private companies, associations and individuals.

This is the Final Report summarizing the activities, lessons learned and legacy of the FOREST Project and this report covers the entire FOREST Project – July 21, 2000 – July 21, 2005.

A. Executive Summary - Snapshot Project Highlights

The project had four primary components with three cross-cutting components, and it should be noted that the cross-cutting components actually fed into the work of the primary components and led to their key results. The FOREST Project exceeded all expectations and may possibly be considered one of USAID/Russia's finest projects to date. Below, we have tried to give a snapshot 'big picture' understanding of the key results in our primary components; for further information, please consult the individual component sections.

Component 1 - Fire Prevention

The project developed and implemented interdisciplinary school curriculum in fire prevention, which was tested in 400 Russian schools, modified several times and is currently being used in more than 1,000 schools in the five model regions of the project. In the Khabarovski and Krasnoyarski Krais, the project established two information centers operating within the structure of forest agencies, whereby the centers' websites provide information related to regional forest agencies, laws and legislation, information related to non-governmental organization (NGO) partners, as well as off-the-shelf advocacy campaign materials related to fire prevention which was created in the course of the FOREST Project.

To replicate the results of the work done with the sponsorship of the FOREST Project we have created a handbook entitled "Working with Communities in Preventing Forest Fires", which includes FOREST methodologies and materials. This handbook was approved by the Federal Forest Agency of Russian Federation in 2005. The Federal Forest Agency and the NGOs of the Khabarovski and Krasnoyarski regions contributed to writing this manual. The handbook ensures the sustainability of long-term educational programs, implemented by the FOREST Project.

It should also be mentioned that the project played a role in developing a civil society in the model regions. Despite the fact that we mostly focused on public education campaigning aimed at fire prevention, we were able to significantly increase the importance of civic initiatives in this area, which obviously will have a long standing effect. Our goal was not only to teach the participants modern campaigning techniques, but also to assist them, especially NGOs, in playing a more important role in fire prevention campaigns.

During the last years of the project, when NGOs gained sufficient expertise and skill, they not only became better partners in this work, but demonstrated their leadership skills and developed as fire prevention centers. By the end of the project, more than 60 such entities had worked with us in this area making a profound in-road to assisting civil society development and the project established direct partnerships with more than 750 such organizations. Our work with NGOs was directed at identification of active NGOs, holding workshops and training sessions for NGO employees, hosting joint events and actions, and conducting campaigns and distributing materials.

As part of project conclusion, Russian wildfire prevention experts were trained in the United States. Employees from the Federal Forest Service, the Russian FEMA, media sources, and directors of national parks were among the participants of the study tour organized by the project. In the course of their training they discussed interaction between governmental and non-governmental organizations and prevention techniques used by the U.S. Forest Service, Virginia Department of Forestry, and the Office of Wildland Fire Coordination of the U.S. Department of the Interior. The participants visited the Shenandoah National Park, where they learned about the park educational efforts among visitors, picnic area equipment, and wildfire suppression systems in national parks.

It can be said that the project not only created very significant results in the area of fire prevention advocacy, but also linked the Ministry of Natural Resources with the regional Centers

for Forest Protection, as well as in some cases, directly with NGOs implementing the work. In addition, as the US Forest Service held a seat on the Advisory Council, the project acted in a manner to bring together forestry officials from both Russia and the USA.

Component 2 – Pest Monitoring

Based on the same system employed by APHIS, the FOREST Pest Monitoring Team developed a pheromone trapping system entirely in Russia, including: 1) development of the artificial sex pheromone and its dispenser, 2) production of the plastic laminated paper pheromone traps, and 3) production of fumigant strips. The Pest Monitoring Team organized production of all of these components by Russian companies.

In implementation, the Centers of Forest Protection delivered larvae sampling results to the Russian Center of Forest Protection *Roslesozaschita.* Now they deliver and simultaneously post moth and larvae results on an Internet site. The team developed a computer model, EcoSentinel/SM (Siberian moth), and transferred it to *Roslesozaschita*, where trained staff can now use it to analyze the data. The model processes moth and larvae sampling results and predicts the development of potential pest population outbreaks. This information is presented in map format and depicts the foci of the potential outbreaks using any one of many existing GIS formats. The system is now being used in seven regions of Russia over almost one-third of Russia's forested land.

Furthermore, the Pest Monitoring Team organized eight interregional technology transfer/training seminars in Krasnoyarsk (3), Irkutsk, Khabarovsk (2), Vladivostok, and Yuzhno-Sakhalinsk. Leading Russian experts in forest protection trained a total of 450 local foresters and administrators. Using this approach, the project also trained 200 forest protection specialists from five regional Centers of Forest Protection individually and in groups on how to use GPS and pheromone traps. These 200 individuals then trained others in their regions.

The Pest Monitoring Team also developed forest pathology zoning maps for Krasnoyarski, Khabarovski and Primorski Krais, and for Tomskaya, Irkutskaya, and Sakhalinskaya Oblasts. With some assistance from FOREST, the Republic of Buriatiya also produced a zoning map. In developing plans for regional monitoring, these maps enabled a reduction of 70% of the forest territory to be monitored in order to have adequate and accurate information for decision making.

Like the Fire Prevention work which is being institutionalized through NGOs and the Ministry of Natural Resources, in this case the work completed by the Pest Monitoring Team is being sustainably implemented through the Centers of Forest Protection and leskhozes (forest farms) in the various regions. This is significant because it will carry on after FOREST Project closes and will continue to provide benefits to the Russian Federation.

Component 3 – Non-timber Forest Products and Secondary Wood Processing

Under the secondary wood processing and NTPF component, FOREST strengthened associations and worked with their members to increase value added processing of forest products. The Project supported 6 associations, facilitated the companies to attend 28 tradeshows, facilitated interregional ties, assisted associations to conduct their annual meetings,

helped them develop web pages, newsletters, advocacy, and training sessions for members. The program worked with regional governments, indigenous peoples associations.

FOREST supported 124 companies, by increasing their staff's technical and business skills. The Project provided assistance in long term product development, increasing the value of products and increases the sales of products. As a result the Project helped companies complete seven feasibility studies and16 business plans. Four new operations were established, 27 technologies and product lines were introduced, $5 Million dollars in equipment was purchased and 74 new products were developed.

One hundred and eighty-two people participated in 28 trade shows and study tours (13 of which were international). More than 750 people were trained in 40 workshops. FOREST helped attract $37M in foreign investment.

Component 4 – Biomass Energy

FOREST recognized at the onset that opportunities for utilizing biomass energy to strengthen the forest products industry and the economy of Russia existed. Given the increasing costs of energy, fossil fuels, and transportation in the region, utilization of wood-processing by-products - commonly viewed as a waste disposal problem – could enable secondary wood processing companies to reduce waste management costs; replace purchased fuel and electricity with self-generation; provide reliable energy supplies; reduce the cost of processing facilities; produce higher value products for export; and provide local employment opportunities. Faced with initial skepticism and limited technical capacity in the region, the Biomass Energy Team successfully developed trusting relationships with company technical personnel, design firms, Russian consultants, and U.S. and Russian equipment suppliers and manufacturers to move biomass energy projects forward.

The Biomass Energy Team worked closely with 19 partner companies to greatly exceed its target indicator of 50 MW thermal biomass capacity. The Team provided technical and financial assistance in the design, construction, and operation of biomass boilers and dry kilns; conducted site visits, design review sessions, workshops, and regional and international study tours; and disseminated information to raise awareness. The design review sessions were instrumental in expanding the skills of Russian specialists in the region through cooperation and collaboration among companies. Altogether, the Biomass Energy Team conducted a total of 73 training events and trained 750 specialists. Furthermore, FOREST partner companies anticipate earning a total profit of over $14,600,000 USD/year in the production of value-added wood products.

As the benefits of biomass energy activities gained recognition, FOREST received increasing numbers of requests from companies in search of assistance to develop biomass energy systems capable of burning wood wastes. With FOREST assistance, one long-term partner company, Igirma-Tairiku, developed a modified biomass boiler, the first of its kind to efficiently burn wet bark in the region, thereby serving as a model for other companies. Another FOREST partner company, TM Baikal, then developed a similar modified biomass boiler based on Igirma-Tairiku's experience.

The Biomass Energy team also collaborated with local and regional government administrators to explore the possibility of utilizing wastes to meet heat and power needs of remote settlements. The cost of supplying coal and diesel fuel are several times higher than the cost of biomass energy in these areas. A FOREST civil society workshop determined that markets exist for regional and local governments to implement pilot small-scale biomass systems to generate power and heat at reduced costs to remote off-grid small companies and communities in the Russian Far East and Siberia. Several pilot projects are currently under consideration.

Overall, the Biomass Team developed a core base of Russian expertise and partnerships, and created working examples to serve as models for other companies, in the region. The FOREST Project also raised understanding and awareness across the industry in a way that built on existing Russian expertise and added American expertise where it brought most value.

B. Project Innovations

Several innovative ideas emerged and were tried under the FOREST Project. Winrock proposed to use **US volunteers** to support all aspects of the project. This in turn supported George W Bush's Presidential Initiative, *Volunteers for Prosperity.* In addition, however, FOREST staff saw the potential value of using **Russian Volunteers** on the project. This was a new approach for Winrock and proved to be very successful. Not only did Russian companies benefit, but it also provided Russians a concrete way to volunteer and give back to their community. Through this initiative, FOREST promoted civil societies by engaging Russians in their communities.

To strengthen the ties between U.S. and Russia, Winrock also piloted **Russian Volunteers in America,** which primarily helped U.S. companies to conduct business in Russia.

Winrock made an effort to hire experts from the private sector for market research who could develop long term relations with the Russian companies instead of hiring academic experts. As a result, one partner, R.E. Taylor and Associates, chose to conduct a tour of Russian companies funded by their clients, to explore investment and purchasing Russian lumber. This private involvement will likely continue after the project has concluded.

Our work bringing non-timber forest and secondary wood processing companies on **trade missions abroad and to Moscow** (from the RFE and Siberia) was extremely significant in that by the end of the project this activity no longer was being supported by FOREST but rather the companies themselves learned the value of these opportunities and the companies were now funding the trips at 100% in most cases. This project innovation was accomplished by increasing the level of cost sharing for participation on the missions during the third, fourth and fifth years of project implementation, which not only conserved project funds but raised the level of buy-in by participants since they were required to pay a percentage of the cost.

The use of **Working Groups** of Russian experts also proved to be an extremely significant innovation for the Fire Prevention, Pest Monitoring and Biomass Components. In this manner, we were able to constantly involve Russians with direct expertise in the associated components and continue to develop buy-in with the project. As well, we would become aware of any

necessary changes to meet the shifting needs of the project. Particularly this innovation served our Pest Monitoring Team very well as it was able to maintain close contact with decision makers and implementers on the Russian side while following through with project implementation.

Study tours were particularly effective for the training of fire prevention advocacy and developing expertise with Russian biomass technicians. In both cases, we took roughly ten representatives to the U.S. and they learned directly from experts in their field. The tours also were effective generating new bonds with American peers, which should continue to have a lasting effect after the project ends.

C. Management and Administration.

Winrock international had developed a team which included Chemonics International and The Heron Group. The project had three offices, the main office in Khabaorvsk, and two satellite offices in Krasnoyarsk and Sakhalin.

The project was managed by groups of senior managers, the project manager, and the deputy project manager - we changed the project manager and deputy project manager midway to adapt to the ever changing environment. The project was further divided by the components, comprised of U.S. and Russian experts. An administrative team in Russia (accountants, contract managers, translators etc) kept the project going. The entire project was supported in the U.S. by a program manager and administrative assistant.

1. Advisory Council

As proposed in the RFA, Winrock developed an Advisory Council. The purpose of the council was to help the FOREST Project coordinate with on-going activities in the regions and the government and to engage the local administrations in the project. The council was comprised of a representative from the local administration and local representative of the Ministry of Natural Resources[1] for each project targeted krai or oblast. In addition, representatives of other key organizations working in the forestry sector in Russia and identified experts were invited as members, such as the World Bank, USDA Forestry Service, Deputy Head of the Forest Academy, Saint Petersburg, Chief Editor NTV, Deputy Head of the Department of Energy, and Wildlife Foundation. The FOREST Project Manager and two representatives from USAID also sat on the Council. **Annex A** shows all members of the Advisory Council.

By-laws were established as guidelines for the council (see **Annex B**). The council met twice a year, December and June, to learn about the project's activities and results and was responsible for approving all grants and annual work plans. Between the meetings, the Advisory Council was updated with quarterly reports.

The Advisory Council was an extremely important part of the project. During the first meetings, there were lively discussions about how the project should be managed. Many of the members

[1] Shortly after FOREST began, President Putin dissolved the Russian Federal Forestry Agency and all forestry activities fell under the Ministry of Natural Resources.

were interested in what the project would do for their area, how much money would be invested in their krai/oblast. Because of the lack of projects in these areas, most of the members did not understand how to partner with USAID and what it meant.

Meetings in the first few years rotated between the project krais and oblasts. This ensured people could attend and the meetings were held where the activities were conducted. From 2003, when activities were being adapted at the national level, the meetings were held in Moscow to ensure participation from the Ministry and USAID. The Head of the Forestry Agency was present at the last two meetings, demonstrating the Ministry's commitment to the project.

The importance of the Advisory Council extends beyond the FOREST Project. As mentioned, government officials, both from the Ministry of Natural Resources and the local administrations had not been involved in USAID Projects. This increased their awareness of USAID and most became strong supporters of the project and of USAID. This is perhaps one of FOREST's greatest successes and led to the success of the technical components.

2. Key Partners

The FOREST Project served as a catalyst to build the capacity of local Russian partners and to collaborate with other ongoing projects. It was anticipated that there would be overlap between USAID's FOREST Project and the World Bank's Pilot Project, but as it turned out, the Pilot Project did not begin until FOREST was completed. There are numerous partners FOREST worked with, and most will be detailed in the component reports. Here are some that collaborated with the entire project:

Russian Partners

- Ministry of Natural Resources
- Rosleshozaschita
- Regional Centers of Forest Protection
- Khabarovoski Krai Government
- Krasnoyarski Krai Government
- Primorski Krai Government
- Sakhalinskaya Oblast
- Irkutskskaya Oblast
- Far Eastern Economic Research Institution
- Ministry of Education
- Suchachev Institute of Forestry
- Far Eastern Forestry Research Institute
- Moscow Forestry University
- Saint Petersburg Forest Ecology Center

International Partners

- Replications of Lessons Learned
- IUCN- The World Conservation Union
- WWF – World Wildlife Fund

- Wildlife Conservation Society
- McGregor Model Forest Project
- US Forest Service
- World Bank
- R.E. Taylor and Associates
- RFE-US Partnership Program
- Regional Initiative (State Department Program)

3. Integration of Project Components

The four technical components of FOREST (fire prevention campaign, pest monitoring, non-timber and secondary wood products and biomass energy) seemed like discrete and separate areas, in fact there was overlap and collaborating within the program.

We learned, for example, that biomass energy made the most economical sense if wood processing facilities developed the ability to use their waste material as fuel for energy. The project focused on the simplest system, using fuel to operate the dry kilns. To make the model successful, we needed to train the companies on how to properly dry the wood and help them identify markets.

Similarly, many of the collectors of non-timber forest product frequent the forests and were included in some of the activities of the fire prevention campaign.

We learned that in many cases severe forest fires occur in regions that have previously had massive pest outbreaks where the dead forest is a source of fuel for extreme forest fires.

Thus, we learned that Fire Prevention and Pest Monitoring components linked up in some cases as did the Secondary Wood Processing and Biomass components. Understanding that the core focus of the project was to implement sustainable forestry practices in the Russian Federation, these links between components lead us to complete synergy of the program and in effect creating one of USAID Russia's most successful projects.

II. Four Technical Components

A. Component 1 – Fire Prevention

1. Introduction and Component Goal

Russian forests account for almost 25 percent of the world's forest and timber resources. They are critical in preventing global climate changes and preserving regional biodiversity. Wildfires are the most serious threat to these forests. Research reveals that each hectare of burned forest leaves from 50 to 100 ? ^{3} of damaged timber, resulting in losses of at least $100 per hectare. The annual losses from forest fires in the Khabarovski Krai alone totals nearly $17 million and the annual cost of fire suppression in the region is $3 million. In addition, wildfires affect the health of the local population. The smoke from fires enveloping Russian cities and towns has been known to cause pulmonary and cardiovascular diseases.

Humans are the most frequent cause of wildfires in Russia. According to official statistic data, 70 to 90 percent of fires in the Far East and in Siberia are caused by humans. The Forest Fire Prevention and Public Education Component, awarded to Chemonics International, sought to develop and institutionalize a national forest fire prevention public awareness program.

Despite the economic losses and harmful impact of fires, average Russian citizens have largely been unaware of the significance of this problem or their role in resolving it until recently. Research has shown that eight out of 10 wildfires in the Far East and Siberia are caused by humans. However, FOREST experts discovered early in the project that people living in the Far East of Russia tended to disregard this problem. Russia also lacked a national systemic approach to teach people safe behavior in the forest and raise civic awareness. As a result, Russians have focused efforts on fighting fires rather than preventing them. In fact, the country has spent millions of dollars on finding more effective techniques of fire control and suppression even though experience has shown that outreach programs directed at raising forest fire awareness are ultimately more effective.

The main goal of the FOREST Project's fire prevention component was to develop and implement a systemic approach to public education and outreach in Russia. Strategies of conducting forest fire prevention campaigns in the U.S. and other countries, and methods developed by the FOREST project specifically for Russia, became a basis for large campaigns conducted by the project and transferred to local organizations upon project's completion. We did our work in five regions of the Far East and eastern Siberia: Khabarovski Krai, Primorski Krai, Krasnoyarski Krai, Sakhalinskaya Oblast and Irkutskaya Oblast.

2. Summary of Results and Impact

The first part of the FOREST Project (2000-2003) was devoted to developing a public education methodology that would effectively teach fire prevention to various communities. The second part of the program, Years 4 and 5, focused on implementing its accomplishments on regional

and federal levels. The Wildfire Prevention and Public Outreach Component worked in the following areas:

- Development and implementation of the public education and outreach program
- Hosting events and training sessions in fire prevention; publication of books, brochures, fact sheets, and bulletins
- Development of the targeted school curriculum to teach children safe behavior in the forest
- Work with forestry experts to share expertise in conducting fire prevention campaigns and improving communication skills
- Improving the work of non-governmental organizations (NGOs) on the regional level and involving various NGOs in fire prevention campaigns
- Work with media outlets
- Setting up information centers to disseminate fire prevention materials

To replicate the results of the work done with the sponsorship of the FOREST Project we have created a handbook entitled "Working with Communities in Preventing Forest Fires," which included FOREST methodologies and materials. This handbook was approved by the Federal Forest Agency of Russian Federation in 2005. The Federal Forest Agency and the NGOs of the Khabarovski and Krasnoyarski regions contributed to writing this manual. The handbook ensures the sustainability of long-term educational programs, implemented by the FOREST Project.

We developed an interdisciplinary school curriculum in fire prevention. The curriculum was tested in 400 Russian schools; it was modified several times and is currently being used in more than 1,000 schools in the five model regions of the project. In the Khabarovski and Krasnoyarski Krais, we set up two information centers operating within the structure of forest agencies. The centers' websites provide information related to regional forest agencies, laws and legislation, and NGO partners. It also provides off-the-shelf campaign materials created in the course of the FOREST Project.

Project partners. Combining targeted education and outreach, the fire prevention component of the FOREST Project alerted residents of the Far East and eastern Siberia to the problem of wildfires. Throughout the life of the project, staff worked to organize events, took steps to prevent wildfires, and carried out public outreach programs in cooperation with both governmental and non-governmental project partners. A major federal partner of the project was the Ministry of Natural Resources of the Russian Federation.

The staff also worked closely with forestry employees and stakeholders, including the authorities in the five regions of the project to conduct educational outreach programs to prevent forest fires. Forest agencies, media outlets, schools, NGOs, associations, private companies, community members, and others involved in hosting events and taking steps to prevent forest fires, will likely continue fire prevention efforts after the completion of the FOREST Project. Below are the prominent partners in each region.

- The Khabarovski Krai: The regional Forest Agency and regional government, the Ministry of Education, colleges and universities, the Khabarovsk Institute of

Continuous Education in Environmental Issues and the Use of Natural Resources, media sources, NGOs, forestries, and school forestries.

- The Krasnoyarski Krai: the regional Forest Agency, Taimyr (Dolgano-Nenetsky) and Evenkiysky autonomous districts, the Head Department of Education of the Krasnoyarski region, the Divnogorsk Forestry and Technology College, media outlets, NGOs, forest services, school forestries.
- The Primorski krai: The regional Forest Agency and regional government, forest services, school forestries.
- The Sakhalinskaya oblast: the regional Forest Agency, the Department of Forest Industry Complex, the Regional Institute of Continuous Education of Teachers, the Department of Education, media outlets, NGOs, and forest services.
- The Irkutskaya oblast: the regional Forest Agency, media outlets, NGOs, forest services and school forestries.

Among the project's foreign partners we should mention the World Bank, which assisted in printing the manual, and the U.S. Federal Forest Service.

3. Methods/Approach

Description of approaches and methodologies. The project used a combined approach to working with communities to prevent forest fires. This approach incorporated three areas: 1) planning and conducting targeted educational campaigns on a mass scale; 2) development and implementation of the educational fire prevention curriculum for children of school and preschool ages; 3) training forestry employees in the skills of working in the communities.

The main goal of the fire prevention and public outreach component was to develop an effective strategy aimed at changing the patterns of people's behavior in the forest. Eventually it would result in a lower number of fires caused by humans. To attain this goal, we needed effective and targeted tools to be able to teach people safe behavior in forests. We also needed to introduce tools that could be used in the daily operations of governmental, regional, and non-governmental environmental entities and organizations.

One of the major achievements of the component was the successful development of the required programs and manuals, which were subsequently approved by federal ministries and regional authorities. These materials, prepared by project staff and American and Russian forestry experts, contain methodologies targeted at specific sections of the population. Experts included communications strategists, school teachers, NGO leaders and forest industry personnel. In addition to the development of a theoretical basis for fire prevention campaigning, which could be replicated in other Russian regions, the project staff tested new strategies of reaching different segments of the audience in the model regions of the project.

In the five model regions staff conducted public education and outreach campaigns, held street parades and theatrical performances, and founded recreational areas. Staff worked with forestry specialists to conduct seminars and workshops, lecture courses and study tours. The fire prevention component also worked with NGOs to host conferences, train and organize field consultations for people working in NGOs. College and school students and children of pre-

school age were taught through workshops using school curriculum developed by the FOREST project. The project also developed methods of effective campaigning among university and college professors, librarians and members of the mass media, as well as average people vacationing in the forest.

Major Accomplishments

- Reach more than 2.2 million people since 2000 through fire prevention campaigns developed and conducted by the FOREST Project. Our survey showed that at least 18 percent of those people changed their behavior in the forest.
- Trained approximately 700 teachers in FOREST methodology.
- Wrote and published manual "Working with Communities in Preventing Forest Fires," approved by the Federal Forest Agency.
- Developed the School Fire Prevention curriculum. In 2005 the curriculum was used in more than 1,000 schools in five regions of Russia.
- Over 5,000 copies of the School Fire Prevention Curriculum have been distributed to the teachers in schools and extracurricular activities. Approximately 7,500 students became familiar with the curriculum at special workshops.
- Established a network consisting of eight recreation areas in collaboration with the grants program.
- Established two information centers, one in the Khabarovsk region and the other in the Krasnoyarsk region.
- Trained more than 1,000 forest specialists working in 123 leskhozes (state forest farms) in communication and outreach skills.
- Hosted the "Forest Fire Prevention and Public Education Study Tour" in the U.S. for Russian experts from various agencies in charge of wildfire prevention.
- Trained leaders from 64 NGOs on involving local communities in forest fire prevention campaigns, mechanisms of conducting effective fire prevention campaigns," and effective NGO management.
- Trained 13 trainers.
- Created six audio tapes and 10 videos for media use.
- Completed 20-minute educational film about forest fires.
- Distributed 2.9 million leaflets, 30,000 fact sheets, and 50,000 fire prevention posters.
- Advertised fire prevention campaign on seven, two-sided highway billboards.
- Designed, manufactured, and distributed thousands of fire-prevention souvenirs including pins, key chains, stickers, tee shirts, baseball hats, bags, and bandanas.

Public outreach. During the course of the project, staff of the fire prevention component reached more than 2.2 million people and distributing fire prevention materials in five regions of Russian East Siberia and the Far East. TV and radio outlets aired numerous stories devoted to the problem of wildfires. The DVTRK TV Company alone aired more than 500 public shows and informational videos produced with the sponsorship of the FOREST Project. These programs aimed to prevent human-caused fires. Local media sources did not only work in close cooperation with the project but also paid part of the costs of the informational outreach programs. Local journalists saw the devastating forest fires every summer and quickly understood the significance of this problem better than the general public.

Examples of the work done by local media outlets include:

- The ITA Gubernia (Khabarovski Krai) was one of the first regional TV companies to air FOREST videos free of charge. Five other major TV companies in Irkutskaya oblast aired social advertisements from May to October. The companies aired all informational programs practically free of charge, including public service announcements. The total cost of assistance rendered to us by local TV and radio stations and other private media companies operating in the project area in 2004 was in excess of $300,000. The programs reached 1.2 million viewers in the Khabarovsk krai alone.
- The FOREST Project, working in cooperation with the Veles TV Company, produced a 20 minute documentary, devoted to the problem of forest fires. This documentary was designed as a training manual for mass audiences, ranging from children to adults.
- The Krasnoyarsk Center for Independent Journalists aired five television programs and 34 news programs in August and September 2004. Employees of the Forest Service of the Krasnoyarski Regional Department of Natural Resources took part in these programs. Gallup Institute researchers estimated the television audience of these programs was about 1.6 million.

Another critical method of public outreach was public rallies, street parades, pageants, and theatrical performances of educational nature. We held more than 1,500 public events. Examples of events include:

- *Public transportation campaigning.* Campaigning in the public transportation was conducted with the participation of the NGO Alliance in Komsomolsk-on-Amur, and the Ecoterra Theatre and Studio in Khabarovsk. Actors wearing the costumes that were specifically designed for this event used the script and played skits for tram and trolley passengers. These skits incorporated the rules of acceptable behavior in the forest, including the requirement to extinguish the fire when leaving a camping site. The skits captured the people's interest and proved to be an effective campaigning method. The Forest Service intends to continue to hold these events and expand them to other big cities in the region.
- *Street parades on city holidays.* When the Krasnoyarsk celebrated its yearly anniversary, project staff took advantage of the festivities to put on a costumed parade along city streets. The children, members of the Center for Young Naturalists, wore bear and tiger costumes designed by the FOREST Project. They distributed campaigning materials as they marched down city streets. More than 200,000 people participated in this celebration in the streets of the city. Media coverage reached a million people.
- *Theatrical performances.* The FOREST Project sponsored the Scarlet Sail Children's Theatre and Studio in Khabarovsk to produce the play "I Will Give You a Gift of Thousand Years," based on the book "When the Taiga is Burning," by Sergei Kucherenko. The play, acted out by children ages 9 to 15, teaches youth to love and cherish the forest and its dwellers. The play was hit and the young actors toured the region performing in children's summer camps and educational institutions.

The FOREST project created a network of eight recreational areas in five regions. These recreational areas, which cost $117,000, were built with the purpose of offering people a place to camp, picnic, and peruse the forest educational and informational centers. The areas offer picnic tables and benches, camp sites to build fires, public restrooms and trash containers. There are also parking lots and fire fighting tools. The state forest security service said that as a result of these efforts, not a single fire was registered in the adjacent forests.

The project made and installed seven billboards along major highways that lead to the most popular summer forest resorts of model regions. According to the survey data obtained by the FOREST Project, the old signs were ineffective and did not capture the attention of drivers and passengers. Therefore, fire prevention and public outreach staff designed new billboards and replaced them. They featured innovative and advertising solutions based on U.S. and Western European standards. The billboards will be maintained by local administrations and will be used only for the purpose of fire prevention.

Training forestry specialists. During the course of the project, we held more than 30 workshops and training sessions for forestry specialists employed in governmental agencies. Nearly 1,000 specialists from more than 120 leskhozes attended special workshops to improve communication skills. The workshops helped expand the range and raise the efficiency of fire prevention efforts and campaigns in the communities.

Our goal was not only to pass along the expertise we had accumulated in the few years of working on the project, but also train forestry specialists to develop and design outreach campaigns to prevent forest fires. In the course of the project we held more than 1,500 events, including holiday street parades, joint competitions, etc. in cooperation with regional departments of natural resources, regional emergency ministries, the Forest Agency and local administrations. Examples of joint events include:

- The cities of Komsomolsk-on-Amur and Amursk in the Khabarovski Krai held several month-long forest fire prevention campaigns sponsored by FOREST. The Khabarovsk Regional Department of Natural Resources and Environmental Protection of the Russian Ministry of Natural Resources, young foresters, forestry and school employees worked jointly to reach out to the communities to prevent forest fires.
- The Administration Department of the East Siberian Railways and the Irkutsk state-owned Bus Enterprise No.1880, which had never before taken part in public outreach efforts, helped get across the fire prevention message to audiences of more than 5,000 by distributing public service announcements using audio tapes at local railway stations.
- The FOREST Project established connections with the Center for Fire Prevention and Public Relations of the Department of State Fire Prevention Service of the Russian Federation FEMA in Khabarovski Krai. Prior to the 2004 fire season the agency employees organized a series of fire prevention events in schools, child care centers, and children's summer camps. For this purpose, FEMA employees made regular use of the FOREST Project leaflets, banners, posters and stickers.

- In 2004, all 52 leskhozes and the Department of Education of the Irkutskaya oblast participated in distributing 175,000 instruction leaflets. Three of the biggest private city markets, eight city shops and department stores, two companies involved in processing non-timber forest products and other private companies participated in this campaign.

The FOREST Project methods of fire prevention were described in detail in "Working with Communities in Preventing Forest Fires" manual. This manual aims to help improve the communication skills of forest employees, as well as instruct on effective communications strategies.

Thousands of copies of the manual were printed and distributed in 2005 in partnership with the World Bank and the Rosleskhoz. In December 2004 and in January and February 2005, FOREST hosted a number of workshops and training sessions for the employees of the State Forest Security to use the manual. A total of 120 people were trained.

Prevention Manual Praised

"Fires caused by humans present a great challenge for us. We need prevention; we need the type of work the FOREST Project is doing. We have never done this work before. True, we printed posters and slogans, but we lacked a systemic approach… The FOREST Project manual teaching to work with communities is a very positive work. I never saw anything like this in Russia… We intend to use it in today's work and will use it in the future." *-A.A. Kasparov, director of the Rosleskhoz Department of Forest Conservation and Protection, November 3, 2004.*

Work with NGOs and associations. Staff of the fire prevention and public outreach component also worked with NGOs and associations so they could expand prevention campaigns and raise awareness of the problem of forest fires.

We identified the most socially active NGOs and the NGOs that had available resources and were interested in conducting public education campaigns. The work started in 2002 with 15 partners. By September 2004, we had 64 partners. Most leaders of local environmental and educational NGOs in the five model regions attended training sessions and workshops hosted by the project.

As a result of communications training provided by U.S. and Russian trainers, NGO employees acquired the necessary skills to work with different segments of the population to prevent forest fires. Armed with new expertise, NGOs organized more than 1,500 events, including:

- In 2002, the Alliance NGO conducted a six-week campaign to prevent forest fires in the Komsomolsky County of Khabarovski Krai; the Pilgrim NGO conducted a similar seven-week campaign on Sakhalin.
- The NGO Krechet developed and designed a campaign with hunters and fishermen as its target. Currently, when hunters and fishermen obtain licenses during a fire season, they also receive mandatory leaflets containing instructions on forest fire safety.
- In 2004, the Nash Krai NGO conducted an educational campaign to prevent forest fires with vacationers as its target. They succeeded in reaching out to approximately 150,000 residents of the Krasnoyarski Krai. The campaign included social events held in the popular locations for family outings, both inside the city limits and in the suburbs. They also campaigned at other locations including the zoo, city libraries, and

the railway station. This event received good coverage in the *Nash Krai* and *Krasnoyarsky Rabochiy* newspapers and the Afontovo TV station.

Planned Nature Trail Will Help Teach

With the assistance of a volunteer, the project developed a master plan, including the design of basic educational components and landscaping to build a nature trail in the Bolshehehtsirsky Forest Reserve in Khabarovski Krai. The nature trail will contribute to improving overall environmental education and serve as a basis for raising fire prevention awareness and forming safer behavior patterns. The creation of the nature trail will help attract and train more tourists and students living in Khabarovsk city and the Khabarovski region. Similar master plans have been developed for the Amur Environmental Park, the Environmental Park in Komsomolsk-on-Amur, the recreation areas in the village of Sosnovka (the Khabarovsk region) and Beryozovaya Roshcha (city of Krasnoyarsk).

In addition, FOREST created a database containing contact information of those NGOs that were interested in conducting public education campaigns to prevent forest fires. Upon the completion of the project, the database was transferred to local forest agencies to help continue joint efforts.

To support the non-governmental sector, the project helped develop "The Manual in Preparing and Hosting Mass Events to Prevent Forest Fires," designed for NGOs. The manual is still in demand among the leaders of local NGOs and associations. They use it to prepare for public environmental actions and fire prevention campaigns.

In 2004, the project hosted a number of training workshops on stakeholder cooperation. We trained 219 representatives of partner NGOs and associations in the Khabarovski and Krasnoyarski, Irkutskaya and Sakhalinski regions as well as in Buryatia. Leading U.S. and Russian experts in forestry, education, and mass communications held training workshops for the NGO leaders and employees. At these workshops the NGO participants discussed the issues of efficient organization of educational fire prevention campaigns, and learned about obtaining additional funding for community outreach to prevent forest fires.

In November 2004, component staff held its final workshop on efficient management of NGOs for the most active non-governmental organizations. The two-day workshop aimed to help NGOs make their organizations more efficient and obtain funding to carry out their plans. One component of the workshop included a role-playing exercise that featured a meeting between a sponsor and a NGO representative. In these training sessions, participants reviewed typical errors made in these situations and learned to structure their relations with the potential donor. Many participants said the most exciting and useful thing they learned was the fundraising strategy.

The FOREST Project solicited organizations to participate in a contest to compete for project's support. The object was to develop innovative public awareness programs that would involve different stakeholders. FOREST staff members reviewed proposals and chose winners based on their potential success. Among the applicants willing to conduct fire prevention campaigns in 2002 were media sources, commercial and non-profit companies, cultural and educational institutions, associations of children and young adults, NGOs, and other initiative groups. Since then, project-supported fire prevention campaigns have been conducted on a regular basis. In addition, children and young adults, who participated in those campaigns, wore bandanas, t-shirts

and hats that had been manufactured specifically for the participants. The public show of support helped disseminate information about the project and unite the participants into one team.

Training college and school students. The FOREST Project developed an interdisciplinary and interactive fire prevention curriculum designed for Russian schools called the FOREST Fire Prevention Public Education Program. The curriculum was designed for elementary, middle, and high school levels.
Each lesson includes a theoretical part and practical part, and includes a role play and question-answer session. The curriculum requires interaction between teacher and students, which helps hold attention throughout. This strategy is seldom used in Russian schools, hence the special innovative value of this curriculum.

There are three versions of the curriculum: integrated, optional, or elective. Regardless of the number of lessons, all courses focus on behavior in the forest. Students learn how to extinguish camp fires, focus on the basic issues of fire safety, and learn the degrees of fire hazard and other topics. The integrated course starts in the first grade and continues at all school levels. Each new level of the curriculum offers new material to ensure deeper understanding of environmental conservation. The optional and elective courses may be used as additional courses complementing the existing school disciplines. As an alternative, they may be used as a separate course for certain audiences. Upon the completion of the curriculum development, testing and modification, school teachers received approximately 5,000 copies of the textbook. More than 7,500 students are using this program. Also, more than 700 teachers attended special teacher-training workshops. The implementation of the curriculum does not require any additional hours in the school academic schedules; it may be integrated into other disciplines and taught in synergy with the basic educational component.

Interactive Teaching Praised

"The General Education Committee of the Administration of the Khabarovsk Region would like to express their appreciation of the work done by the working group of Component 1 of the FOREST Project, funded by the USAID. The fact that this curriculum is topical and critical is self-evident. The curriculum uses non-traditional approaches to the presentation of the material aimed at preventing forest fires. The use of interactive teaching techniques will ensure active involvement of teaching institutions and teachers in the implementation of this curriculum."
-- I. Ivantseva, first deputy chairman of the Khabarovsk Region Education Committee

The project's curriculum is also used in colleges and universities to train future teachers and forest professionals to teach children to protect nature.

Planning and conducting targeted educational campaigns on a mass scale. To obtain initial information to plan our educational mass-scale campaigns and community outreach we conducted an initial public opinion survey, first in the Khabarovski Krai and later in the Krasnoyarski and Sakhalinsk regions. This research allowed us to classify the purposes of visits and outings in the forest, the level of visitor knowledge, and visitor attitude to the problem of wildfires. The survey also helped identify visitors' habitual activities in the forest. The project used the obtained data as grounds for its educational and outreach campaigns.

Next we conducted our research in focus groups, which resulted in a more precise portrait of representatives of certain groups. Our research in focus groups helped identify risk groups, i.e.

sections of the population that most frequently caused forest fires. Having completed this work, we were able to develop and test targeted campaigns aimed at changing behavior in some groups of forest visitors. Our first campaign was conducted in the Khabarovski Krai and included hunters and fishermen as its target. Our next campaign was targeted at the people who enjoy picking wild mushrooms, berries, herbs, etc. in the forests adjacent to Khabarovski Krai. Still another campaign targeted campers in the Krasnoyarski Krai. We conducted research and hired experts, who designed various logos, symbols and informational fire prevention materials, which were used in educational campaigns, TV videos and radio tapes, leaflets and posters.

The results of this research were published in fact sheets. They also described different aspects of the damage caused by wildfires, how they affected the economy, environment, and the health of people residing in Siberia and the Far East. Project staff distributed a total of 30,000 fact sheets, 2.9 million leaflets, and 50,000 posters targeting different audiences.

Wildfire Prevention and Public Outreach Component employees worked to identify new groups interested in training, organizing public events, and distributing forest fire prevention materials, and established partnerships with them.

In 2003 and 2004, thanks to the communication workshops for forestry personnel, employees of the Far Eastern and Siberian leskhozes learned how to cope with resource shortages through establishing a partnership network. And in 2003, the project arranged free TV and radio broadcasts of forest fire prevention announcements, getting the message to hundreds of thousands of people.

Working with school students. When we finished the research conducted during the first six months of the project it became clear the country needed a school curriculum that addressed forest fire prevention for children of different ages. In the first two years of the project, more than 20 U.S. and Russian consultants, mostly teachers working in local schools, developed the educational curriculum for school students. Our staff collaborated closely with several working groups that gave valuable input in this process. In 2002 and 2003 the curriculum went through several phases of testing in the project's five model regions.

When teachers implemented the new school curriculum, they became aware of the importance of their work in preventing forest fires and environmental education in general. For three years the project conducted workshops, training teachers of various disciplines and specialists in extracurricular activities in how to teach the new curriculum in Khabarovski, Krasnoyarski, Primorski Krais and Sakhalinskaya, and Irkutskaya Oblasts. School teachers trained by us not only taught children correct behavior in the forest but also, together with their students, participated in distributing leaflets and organize mass public events.

In modifying the school curriculum, we focused on the four years of positive experience using the first version of the curriculum and meeting the standards of Russian pedagogical science. The curriculum developers held numerous consultations with those teachers, who actively incorporated the curriculum into their teaching. In addition, project staff had regular meetings of our working groups and held several roundtable discussions. As a result, we resolved the most critical issues: the identification of those types of educational institutions that required additional

work on the curriculum, the students' ages, and the ways and means of incorporating the curriculum in the school teaching process.

Study tours. As part of project, Russian wildfire prevention experts were trained in the United States. Employees from the Federal Forest Service, Russian FEMA, media sources, and directors of national parks participated in the study tour. In the course of their training they discussed interaction between governmental and NGOs, prevention techniques used by the U.S. Forest Service, Virginia Department of Forestry, and the Office of Wildland Fire Coordination of the U.S. Department of the Interior. The participants visited the Shenandoah National Park, where they learned about the park educational efforts among visitors, the equipment of picnic areas, and studied the system of wildfire suppression in national parks.

Information centers and websites. To ensure the application of techniques and materials after the completion of the FOREST Project, we helped create two information resource centers. In 2004, Information Resource Centers for Wildfire Prevention were opened in the Krasnoyarski and Khabarovski Krais. The centers store and disseminate information. Each center has a website. The websites serve as tools of disseminating fire prevention information. Center staff also design and produce materials that are used in outreach efforts to prevent wildfires. The centers are critical in ensuring interaction among Forest Services, regional and county authorities, educational institutions, and NGOs.

The Krasnoyarski Center was founded by the Divnogorsk Forestry and College, the Forest Museum and the Krasnoyarsk Regional Public Foundation for Forest Protection, Security and Reproduction with the funds coming from the project grant. The Information Resource Center in Khabarovski Krai was founded by the Far Eastern Aviation Base of Forest Protection and the Forest Agency of the Khabarovski Krai.

4. Activities and Significance to USAID

The Fire Prevention Component of the FOREST project had the following USAID strategic goal: "To manage environmental resources more efficiently to support economic growth." Our major goals were as follows: establishing model regions, employing modern methods of conducting public education campaigns, and the participation of local organizations in wildfire prevention.

When we started implementing the project in Khabarovski Krai in 2000, the department of the local Ministry of Natural Resources (later known as Forest Agency) and some leskhozes were primarily involved in fire prevention campaigns. They used outdated campaigning methods that produced poor results. NGOs rarely joined the campaigns due to a lack of expertise.

The initial goal of the project was to develop a universal approach to public education and a mechanism for coordinating NGOs, the media, and educational institutions in launching fire prevention campaigns.

The goals of the Fire Prevention Component supported the preservation of Russian forests to save habitats and increase the carbon sink. They supported the USAID strategic objectives to help develop a civil society by establishing strong partnerships between NGOs and government agencies on the local level. The joined efforts of federal entities, NGOs, and private companies

contributed to a non-depleting use of forests in the Russian Federation. FOREST working groups and seminars to discuss challenges to creating forest fire prevention campaigns helped unite stakeholder efforts including those of school teachers, government officials, scientists, and artists; and helped establish strong ties between various partners to ensure program sustainability. Those ties also helped build capacity of local NGOs and will help them play more vital role in fire prevention.

Support for civil society. The project played a role in developing a civil society in the model regions. Despite the fact that we mostly focused on public education campaigning aimed at fire prevention, we were able to significantly increase the importance of civic initiatives in this area, which obviously will have a long-standing effect.

Our goal was not only to teach the participants modern campaigning techniques, but also to assist them in playing a more important role in fire prevention campaigns. During the last years of the project when NGOs gained sufficient expertise and skills, they not only became better at the work, they demonstrated their leadership skills and developed as fire prevention centers.

EcoBus Spreads the Word

The Eco Bus, an "en-route" fire prevention campaign was conducted by the FOREST Project in partnership with Glena and Bald Eagle NGOs in Sakalinsk and Sakhalin Energy. A bus with children and adults traveled across the Island of Sakalin and visited 11 cities and four villages in the twelve counties of the region. In each city the children and adults performed plays and told the local people about safe behavior in the forest. They also distributed leaflets and brochures.

More than 60 leaders of various NGOs participated in the FOREST Project training and seminars. By the end of our work in Russia, NGOs had been involved in a great number of fire prevention actions. That involvement illustrated significant progress since 2000, when NGOs hardly ever took part in fire prevention campaigns.

Another achievement was the involvement of the business community in fire prevention campaigns. Our campaigning through the media and NGOs captured the interest of the business community. In 2004 the Sakhalinsk Energy Company donated $12,000 for the EcoBus fire prevention program in Sakhalinskaya Oblast. Thanks to the support of this company and the FOREST Project, two local NGOs were able to conduct the campaign that reached more than 2,000 people.

During the course of the project, our fire prevention materials and especially the school curriculum became popular among school teachers in all the five regions of the project. As mentioned above, about 1,000 schools and other educational institutions now use our curriculum. More than 400 schools conduct regular fire prevention campaigns in their regions. Our materials are particularly successful in the villages of the Far East and East Siberia. School teachers organize marches, distribute leaflets containing fire prevention materials, clean up fire hazardous materials, and stage school plays for children and adults. They do all these things independently of the FOREST Project. Most teachers participated in the FOREST workshops, where they acquired knowledge and skills that enabled them to conduct such campaigns. Since campaigning materials can be found at the information center websites, teachers will be able to improve them and develop new ones when the project is over.

Forest Fire Prevention Results as per USAID/Russia's Strategic Objectives	
Component 1 Indicator	Total
1.6.5 (3) Number of groups, participating in Forest Fire Prevention Education Communication Programs	**753**
1. NGOs	**64**
2. Population groups	**52**
3.Media outlets	**63**
4. Schools, organizations, extra – curricular education institutions	**451**
5. Leskhozes	**123**

V. Legacy

Since 2003, our major goal has been to get the public education program underway and repeat it. Though FOREST operated in five regions of the Far East and East Siberia these materials can be used in all regions of Russia.

We wanted to develop a program that would become a foundation for the future systemic forest fire prevention efforts in Russia. From the very start we have been working in close cooperation with the Ministry of Natural Resources of Russia and its local offices to do this. The U.S. and Russian specialists worked together not only through the development stage of the program but also through the stage of its implementation. To ensure more effective future use of the program by the Russian Federal Ministry, we studied the organization of Russian state entities and their work conditions to develop the program.

The program sustainable development strategy included the following:

- Publishing manuals and handbooks
- Participation of federal agency officials and representatives of non-governmental organizations
- Development of mechanisms for subsequent independent replication of fire prevention campaigns.

Public education programs have been introduced at the regional and federal levels. At the regional level, we worked with leskhozes (state forest farms), forest agencies of the Ministry of Natural Resources, education councils, city councils, and regional administrations. The Federal Forest Agency of the Russian Federation was our major partner at the federal level. This methodology was required for sustainable development of the programs in Russia upon the completion of our work.

More than 100 leskhozes in the Far East and East Siberia received our materials and were involved in the testing of the public education program. City councils or regional administrations not only authorized all important city actions but actively participated in them. Step by step, we tried to involve various federal agencies in our work to ensure the longevity of these programs. In the final year of the project, when our main objective was to incorporate the process at the national level, the program was well known locally and was officially adopted in many regions as a basic public education program.

Successful Prevention Campaign Continues

On April 15, 2004 directors of various state entities, journalists and the FOREST Project held a meeting in the government building of the Khabarovski region to coordinate actions in the upcoming fire season. The participants discussed and approved the 2004 action plan of wildfire prevention in the region. Among other things, the plan included recommendations to the FOREST Project to continue its successful prevention campaigning in the communities. Decisions taken at the meeting were sent to the local authorities with the instructions "Carry out during the fire season in the forests of the Khabarovski Krai."

The development and approval of special programs and handbooks by federal ministries and regional administrations was one of the most important accomplishments of the fire prevention. The documents we developed offer communication methods to influence various population groups that spread negative attitude towards forest fires. Russian specialists – teachers and forest industry employees – took part in preparing these materials.

The development, replication, and promotion of the project educational curricula had a great impact upon regular schools, extracurricular educational institutions, and forestry schools. About 80 percent of teachers in all the regions of the project implementation are aware of the Fire Prevention Public Education Program developed by FOREST. About 30 percent of schools in those regions use it in this or other form. All forestry schools in the pilot regions use the entire program and use all its materials consistently. About 30 percent of extracurricular educational institutions also use this program to teach classes, host events and organize summer camps, according to research conducted by the project.

Agency Recommends FOREST Expertise

The Federal Forest Agency made recommendations to its regional offices to use the FOREST expertise as an effective tool in fire prevention campaigns.

Spread effect. Another significant achievement of the project was the initiation of the spread effect. Our school program and courses were so popular that many teachers organized similar events in their regions on their own to spread the knowledge to others. At the request of teachers interested in the FOREST Fire Prevention Public Education Program it was sent out to the Primorsky region, Amur region, Republic of Buryatya, Republic of Sakha (Yakutia) located beyond the borders of the project implementation area.

The educational program is also used by NGOs to conduct outreach campaigns. For instance, the Fire Prevention Tram/Bus action, based on a children's program, which was initially implemented in Komsomolsk-on-Amur in 2003 and initiated by the Alliance NGO, was replicated in other cities (Khabarovsk, Krasnoyarsk, Irkutsk, Yuzhno-Sakhalinsk). These actions were highly praised by the federal authorities and covered by the media.

School Teacher Trains Hundreds

Emma Litvintseva, a school teacher from the Sakhalinsk oblast, attended the FOREST workshop in 2002 and then started training local teachers in fire prevention curriculum teaching methods. She trained 432 individuals from 2002 to 2005.

Fire prevention program used different ways of reaching audiences including organizing environmental contests, library exhibits (Irkutsk region), environmental marches, and equipping fire prevention centers. The program also

distributed leaflets in public places in all the project implementation regions. All these are new methods of fire prevention and were developed in the course of the program implementation.

Teachers trained by FOREST later started hosting their own workshops in their respective counties. Thanks to this path of sharing information the curriculum has gone beyond the project boundaries. Some replication examples include:

- In the Island of Sakhalin, the regional Institute for Continuous Education of Teachers conducted a number of workshops on the school Forest Fire Prevention Curriculum without any financial or technical support from the FOREST. More than 200 teachers attended the workshops. Thus, the curriculum developed by the FOREST project was appreciated by teacher training institutes and proved its sustainability.
- In 2005, Departments of Education in the Irkutskaya oblast on their own initiative conducted two seminars for teachers on how to teach elementary and secondary school students using the fire prevention curriculum.
- The Primorski Institute for Continuous Education of Teachers hosted workshops on Forest Fire Prevention Curriculum for school students. In 2004 alone, more than 30 teachers attended the workshops.

New approach to education in Russia. The curriculum has become an incentive for using new teaching methods in Russia. Structuring classes in accordance with the FOREST Fire Prevention Curriculum, teachers encourage students to draw and use theatrical and music components. Together teachers and students write lyrics and leaflets, then print out and distribute them. The FOREST school curriculum is aimed at involving all students and focuses on an individual approach to each student. The method has been employed in the United States for many years but it is just being introduced in Russia. It helps teachers reassess the teaching process and take a different look at teaching traditional subjects in the school curricula and optional disciplines.

Students Share Prevention Knowledge

The Vyazemsky Forestry College (Khabarovsk region) adapted the school curriculum and incorporated it in the college teaching plan. The third and fourth year students (228 students) study the various elements of fire prevention campaigning aimed at all sectors of the population. Today the students of the Vyazemsky Forestry College share their knowledge with the students in 20 county schools during their summer internships.

Thus, the Fire Prevention Curriculum experience has shown that we should not only teach the targeted audience fire prevention but also encourage children and adults to share their knowledge with others. We cannot predict with any degree of certainty the future results of the curriculum use upon the completion of the project, but we can say with confidence that there will be positive results and they will be replicated.

Developing mechanisms for independent dissemination of information. In developing resource centers we focused especially on developing informational websites. In the process of the website development we managed to unite the project's various specialists at Aircraft Forest Protection Bases, Forest Agencies, NGOs, and educational institutions. The website development involved these experts to identify the most pressing needs in regards to information dissemination. This interaction helped a variety of experts identify a common language. It also encouraged them to work together in community outreach to ensure sustainability of fire

prevention campaigns. The websites have also become information sources accessible to a wide range of users.

In addition, during its operation, FOREST established partnerships with numerous regional, county and city libraries in the project regions. It worked in close contact with them, supplying them visual aids and information materials. Thus, the libraries were able to maintain ongoing exhibits of the project materials, which were supplemented with their own materials, and have become distinctive information resource centers of wildfire prevention. Of course, they can only reach out to as many people and are less effective than Web sites, but they work actively and are appreciated by those people who do not have access to the Internet.

6. Lessons Learned and Recommendations

In many ways the project was successful thanks to the key role played by creative people – teachers, NGO leaders, forest protection specialists – who were inspired with the project ideas and disseminated them in the communities. Regular contacts with all partners, continuous exchange of ideas, consultations, working meetings and round table discussions of all areas of work were very important, as they helped make timely corrections and achieve universal results. Lessons learned include:

- *Adaptation of foreign experience.* When we started our work in Russia, we found that existing foreign programs like "Smokey the Bear" had to be completely re-done to be effective in Russia. Though we used the U.S. positive experience in methodology and strategy, major parts of the program were adapted to the conditions of the Russian Far East and Siberia. One of the revisions, for instance, was adding a tiger character to the "Smokey" theme. The tiger is regarded as the most important animal in the Russian Far East and is vulnerable to forest fires more than any other animal.
- *Education of general audiences.* Despite the fact that the targeted public education programs have a small audience and are more effective, we also saw the importance of universal programs aimed at various sections of the population. Such programs were able to draw public attention to the problem of forest fires and lay the foundation for work with targeted audiences.
- *Close cooperation with federal agencies*. Close cooperation with the Ministry of Natural Resources in Moscow and local governments proved to be critical for the successful promotion of the public awareness campaign. The ministry officials were involved in our work at an early stage of the program development. They participated in discussions and workshops, made valuable proposals, recommendations, and comments. Therefore, when the program was ready, ministry and agency officials regarded it as its own and used it in their day-to-day work. The FOREST school curriculum, however, was developed in 2002 by domestic and U.S. specialists without the involvement of the Ministry of Education. This created a challenge for the project. The ministry viewed it as an outside initiative and resented it even though hundreds of schools across the region were already using it. Their resentment significantly slowed down the process of the curriculum approval. As a result, the project involved them in later curriculum amendments.

- *Elevation of NGO status*. During the program operation we also saw the need to elevate the status of NGOs at the regional level. It is important not only to train NGOs in community outreach or assist them to work more efficiently, but also to demonstrate the role played by non-governmental organizations in a civil society. One of the actions that we carried out in the Krasnoyarski region was devoted to the new Forest Code, which was in the final stages of its adoption at that time. We arranged a roundtable discussion for NGO leaders, foresters, civic groups, and the mass media. The participants made recommendations that were sent to the State Duma and the president of Russia. Such meetings are critical in the process of building a civil society, however, they are still infrequent in Russia.
- *Involvement of children.* The method of involving children in public education campaigns has proven to be very effective. Children in the Public Education Program were not only the targeted audience, but also played an important role in campaigning. People responded well to student marches and to children's door-to-door campaigning and distribution of materials, especially in rural communities. Children also tranfered information to adults, educated their parents about issues they learned in school.
- *Legal environment*. In developing our programs we discovered we needed to pay attention to a deeper analysis of legislation and rules and regulations. Lack of attention to this factor in the process of the development of children's fire prevention program resulted in extending deadlines and changing the scope of work at the promotion stage.

B. Component 2 - Pest Monitoring

1. Introduction and Component Goal

In 2000, The Heron Group, LLC joined with Winrock International and its other subcontractor Chemonics International to implement the USAID-funded, 5-year Forest Resources and Technologies Project (FOREST). The Heron Group task, in the Pest Monitoring Component of the project, was to find a means of preventing massive outbreaks of the Siberian moth in Siberia and the Russian Far East, a vast area that extends across eight of the eleven time zones of the Russian Federation.

The Siberian moth (*Dendrolimus superans sibiricus*) is the most destructive forest insect pest of the Taiga forest. Periodic outbreaks of this species have caused extensive defoliation and tree mortality over time. In addition, many thousands of trees in the outbreak area are severely stressed and susceptible to attack by a secondary pest, the black fir beetle (*Monochamus urussovi*), which kills even more trees. The combination of these two forest pests and the damage they cause contributes significantly to dead wood accumulation and the potential onset of extensive wild fires that are almost impossible to control.

In the mid-nineties, for example, an outbreak of the Siberian moth caused extensive mortality over more than one million hectares in the Taiga forest of Krasnoyarski Krai in Central Siberia. So much timber was threatened that the World Bank agreed to provide five million dollars to help control the outbreak. Economists estimate the damage caused by this outbreak to be approximately US 280 million dollars. Clearly, there is a need to take action to prevent losses of such magnitude.

The Pest Monitoring Component goal is **to develop and institutionalize a pest monitoring system that will provide an early warning of an incipient outbreak of Siberian moth.** The intent of the goal is to provide time for decision-makers to consider alternative actions early in the outbreak cycle before it reaches epidemic proportions and is too large to control.

Forest Protection Glossary

Algorithm - procedure that produces the solution to a problem in a finite number of steps.

Geographic information system (GIS) - computerized system that relates and displays data collected from a geographic entity in the form of a map. It is used primarily to conduct analyses and make decisions related to the human use of the physical environment.

Habitat - place where an organism or a community of organisms lives, including all living and nonliving factors or conditions of the surrounding environment.

Host tree – species of woody plant where insects are feeding.

Larvae (caterpillar) – feeding stage in moth development.

Monitoring – informational control (on pest population) including data collection, data processing, results evaluation and prognosis.

Outbreaks – rapid increases in insect pest population density that destroy forest habitat.

Pheromone - any endogenous chemical secreted in minute amounts by an organism to elicit a particular reaction from another organism of the same species. Artificial analogs of sex pheromones are used in forest protection to attract male moths for monitoring purposes.

Traps - chambers entered easily by the pest but from which escape is prevented mechanically (barriers), physically (glues), or chemically (fumigants).

2. Summary of Results and Impact

Results Framework (see Figure 1)

Major Results:

Monitoring system at field level institutionalized. By providing technical assistance and training, the Pest Monitoring Component Team was able to build capacity at the field level which, in turn, led to the various regional Centers of Forest Protection taking full responsibility for all field level monitoring. Additionally, Center Directors, who were also members of the component Working Group continued to express satisfaction with the new technology and continued to use it year after year.

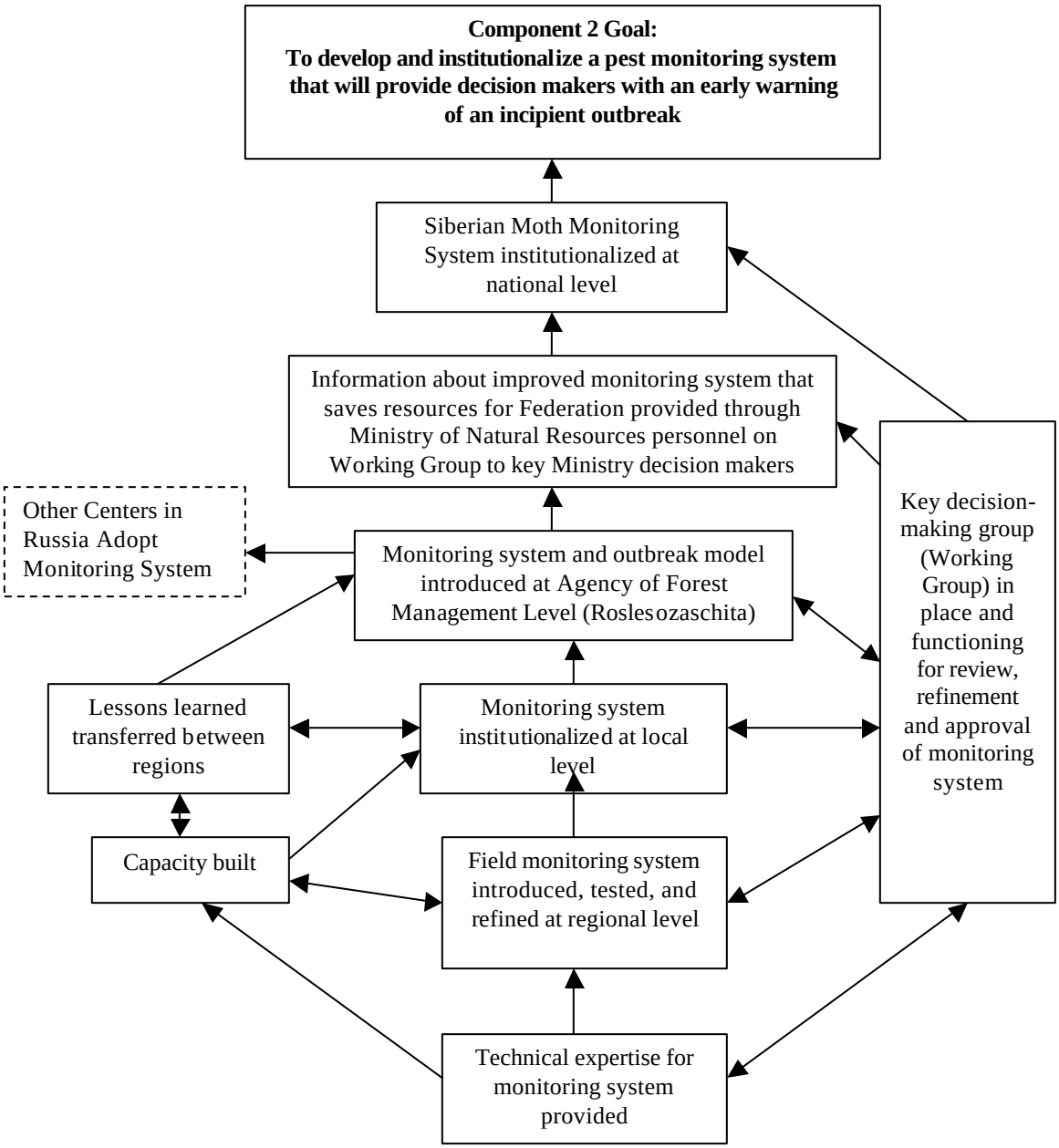
Monitoring system and outbreak model approved at federal agency level. (Roslesozaschita) The Director of the Russian Center of Forest Protection was invited to be a member of the component Working Group. All field directors of the Local Centers of Forest Protection reported to him and received their operating budgets through him. As a member of the Working Group he was very much aware of the accomplishments being made in the field with the new technology. This included the outbreak prediction model that the component team developed in

the fourth year of the project and further refined in the fifth year. Like all other members of the Working Group, he was instrumental in guiding the work of the Pest Monitoring Component so that it could be easily integrated with existing data bases and processes in use by the Agency at the national level.

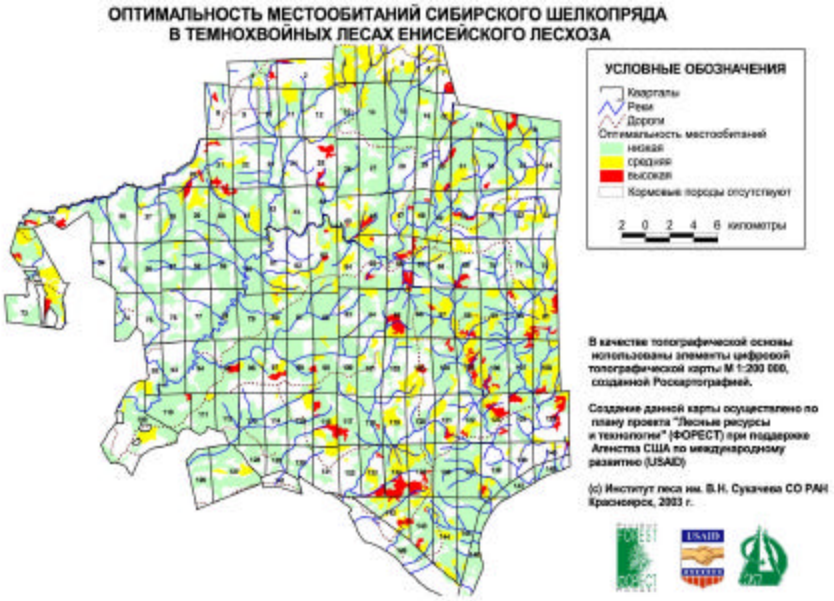
Hierarchy of Forest Pest and Disease Protection Agencies in Russia

Ministry of Natural Resources
Federal Agency of Forest Management
Department of Forest Health Protection
Division of Forest Protection from Diseases and Pests
Russian Center of Forest Protection (Roslesozaschita)
Regional Centers of Forest Protection

Figure 1. Results Framework for Pest Monitoring Component


Component 2 Goal:
To develop and institutionalize a pest monitoring system that will provide decision makers with an early warning of an incipient outbreak
Siberian Moth Monitoring System institutionalized at national level
Information about improved monitoring system that saves resources for Federation provided through Ministry of Natural Resources personnel on Working Group to key Ministry decision makers
Other Centers in Russia Adopt Monitoring System
Monitoring system and outbreak model introduced at Agency of Forest Management Level (Roslesozaschita)
Key decision-making group (Working Group) in place and functioning for review, refinement and approval of monitoring system
Lessons learned transferred between regions
Monitoring system institutionalized at local level
Capacity built
Field monitoring system introduced, tested, and refined at regional level
Technical expertise for monitoring system provided

Siberian moth monitoring system institutionalized at national level. The Chief of the Forest Protection from Insect and Disease Division of the Federal Agency of Forest Management chaired the component Working Group from the very beginning of the project and consequently was always aware of progress and relayed this information directly to higher officials in the Agency and Ministry. By continuing to work closely with key people at the Ministry level, as described above, the Forest Management Agency has been able to convince Ministry officials that the collaborative effort between the FOREST Project and the Russian Center of Forest



Siberian moth habitat quality map for the Yeniseyski Leskhoze (Krasnoyarski Krai) – an example of delineation of the forest inventory units with the highest risk of pest population outbreak initiation.

Monitoring efforts should be located exclusivelv in

Protection has produced technology that has greatly advanced the state of monitoring in Russia. Further, these officials have stated that they want to expand the effort and introduce it to new regions and use it as a standard for monitoring throughout the Russian Federation.

Major Outputs

Output 1 – Cartographic. The Pest Monitoring Team developed forest pathology zoning maps for Krasnoyarski, Khabarovski and Primorski Krais, and for Tomskaya, Irkutskaya, and Sakhalinskaya Oblasts. With some assistance from FOREST, the Republic of Buriatiya also produced a zoning map. In developing plans for regional monitoring, these maps enabled a reduction of 70% of the forest territory to be monitored in order to have adequate and accurate information for decision making. The Component has distributed hard copies of all of the zoning maps described above and electronic versions to the Ministry of Natural Resources, USAID and Winrock International.

Some years earlier, the Sukachev Institute of Forest had developed an algorithm for computer classification of forest inventory units into three levels of habitat quality for Siberian moth. The three categories were high, medium, and low. High quality habitat sites were most likely to support Siberian moth population growth and produce an incipient outbreak. As a result, leskhozes received maps showing forest units with the greatest risk of Siberian moth outbreaks. Monitoring is now concentrated in these units and thereby has greatly reduced the resources needed for effective and efficient monitoring.

Output 2 – Pheromone Traps. The Pest Monitoring Team developed the pheromone trapping system described above entirely in Russia, including: 1) development of the artificial sex pheromone and its dispenser, 2) production of the plastic laminated paper pheromone traps, and 3) production of fumigant strips. The team organized production of all of these components by Russian companies.

Output 3 – Outbreak Prediction Model. Before and during the FOREST Project, the Centers of Forest Protection delivered larvae sampling results to the Russian Center of Forest Protection "Roslesozaschita". Now they deliver and simultaneously post moth and larvae results on an Internet site. The Pest Monitoring Team developed a computer model, EcoSentinel/SM (Siberian moth), and transferred it to "Roslesozaschita", where trained staff can now use it to analyze the data. The model processes moth and larvae sampling results and predicts the development of potential pest population outbreaks. This information is presented in map format and depicts the foci of the potential outbreaks using any one of many existing GIS formats.

Output 4 – Field Guides. The Pest Monitoring Component of the FOREST Project also prepared manuscripts for a three-volume set of field guides, Diseases and Pests of Russian Forests. The Ministry of Natural Resources is publishing all three volumes.

Vol. 1. Diseases of Forest Trees
Vol. 2. Insect Pests of Russian Forests
Vol. 3. Methods for Pest and Disease Monitoring in Russia

These detailed, full color, illustrated field guides are state-of-the-art manuals and will be a legacy of the FOREST Project for Russian forest protection specialists for at least 20 years.

> "The formation and support of the team of authors who worked on "Diseases and Pests in Russian Forests" field guides is an important contribution of the FOREST Project. These state-of-the-art full color volumes will be a must handbook for several generations of forest protection specialists in Russia".
>
> E.Mozolevkaya, Professor, Moscow State University of Forest

Output 5 – Trained Personnel. The component team organized eight interregional technology transfer/training seminars in Krasnoyarsk (3), Irkutsk, Khabarovsk (2), Vladivostok, and Yuzhno-Sakhalinsk. Leading Russian experts in forest protection trained a total of 450 local foresters and administrators. Using this approach, the project also trained 200 forest protection specialists from five regional Centers of Forest Protection individually and in groups on how to use GPS and pheromone traps. These 200 individuals then trained others in their regions.

Impacts

Economic – Outbreak Impacts

One of the most important impacts of the Pest Monitoring Component is that by predicting outbreaks, the potential economic devastation can be greatly diminished. The FOREST Project selected the Siberian moth to work on because it is the most destructive forest pest in Siberia and the Far East. During the 1990's, an outbreak of Siberian moth in Krasnoyarski Krai resulted in 86.5 million dollars of forest resources lost, including timber costs, the cost of growth loss in

surviving trees, as well as the cost of reforestation (Farber et al., 2004). There was also a need to accept a $5 million loan from the World Bank to assist in controlling the outbreak.

The ecological losses were nearly 3 times greater so that the overall impact of the outbreak exceeded 8 billion Rubles (US 280 million dollars).

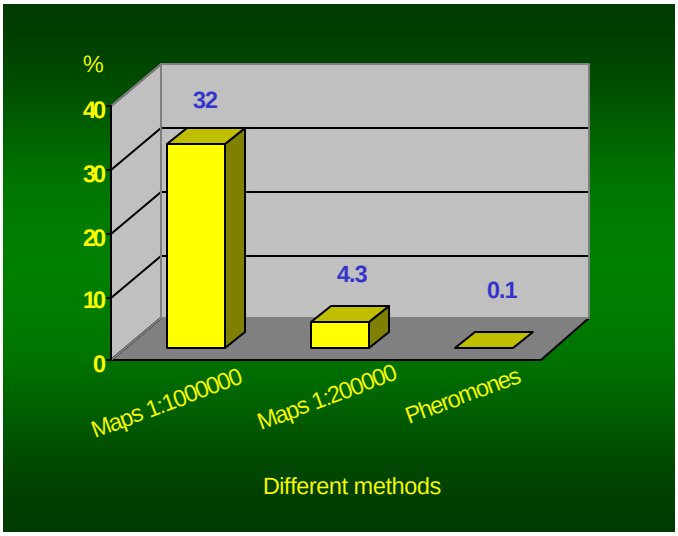
Losses after fir forest defoliation during Siberian moth outbreak in Krasnoyarski Krai (1995-1996)

Resources	Losses in Rubles (millions)	Losses in Dollars (millions)
Forest resources	2,596.1	86.5
Ecological role of forest	5,850.5	195.0
Total	**8,446.6**	**281.6**

Source: Farber et al., 2004

Economic – Reduction in total area monitored

The step-by-step implementation of the cartographic approach greatly facilitated the reduction of monitoring activity from 30 percent to 4-5 percent and even a smaller percentage of the total forested area in Siberia and the Far East. The impact of this approach was to make it far less expensive and easier to monitor for Siberian moth populations. In addition, because moth density between outbreaks is extremely sparse, component specialists introduced the use of pheromone traps which are far more effective under these conditions.



Implementation of maps of different scales greatly reduces the forest territory to be monitored between pest outbreaks. The subsequent use of pheromone traps in some of the high quality habitats enables monitoring efforts to focus on less than 0.1 percent of leskhozes.

The Pest Monitoring Team demonstrated that sampling of larvae is not practical until moth captures increase significantly and signal the build-up of pest populations. This greatly reduces the amount of work needed to monitor the pest over time and results in additional savings for the Ministry.

Organizational – Expansion of monitoring system and institutionalization

Starting in Krasnoyarski Krai in 2001, The Pest Monitoring Component transferred the monitoring system to 7 regions of the Russian Federation, working with the Centers of Forest Protection. The centers are now implementing the monitoring system on 112 leskhozes covering 670 thousand square kilometers of forested land. The Pest Monitoring component organized all activities on a cost-share basis with regional Agencies of Forest Management, local Centers of Forest Protection and later in the fifth year, with the Russian Quarantine Service. This level of involvement by Russian governmental organizations illustrates the high level of interest in the results of the Project and served as a primary source of support for institutionalization of the new monitoring system.

3. Methods/Approach

Main Tasks

The main tasks of the pest monitoring component of the FOREST project were to:

- optimize the pest monitoring system for the most important pests and diseases of Russian forests based on regional population characteristics using geographical informational systems combined with modern sampling methods. (Although the FOREST Project refers to forest diseases throughout the document, there was insufficient funding to do more than include a list of the most important diseases for each region in Siberia and the Far East on each of the seven regional maps developed by the Component team and to produce a state-of-the-art field guide on them).
- transfer and institutionalize the new monitoring system to the Ministry of Natural Resources, and especially to the Russian Center of Forest Protection in Moscow and its' regional Centers of Forest Protection in Siberia and the Far East.

Problems/Challenges

There were several major problems confronting The Pest Monitoring Component of the FOREST Project. The first of these was that there already existed a monitoring system based on sampling larvae in trees on permanent plots. This method, however, is labor intensive, time consuming, and inefficient when monitoring sparse populations of Siberian moth. The Pest Monitoring Component modified the traditional monitoring system through the use of pheromone traps as the primary step in the monitoring process and introduced GIS and GPS technologies and development of a model to predict insect population increases over time.

> "The Pest Monitoring team of the FOREST project demonstrated great wisdom to unite efforts of fundamental science and state forest management services to develop an effective Siberian moth monitoring system. This is a good example of science innovation potential and implementation in forest management".
>
> E.Vaganov, Academician, Director,
> Sukachev Institute of Forest SB RASc.

The component team was able to convince our Russian partners that we did not want to replace larval sampling with pheromone monitoring but rather to work together to build the best monitoring system we could. Our desire to build a completely Russian monitoring system supported our approach, and by the end of the first year we were producing Russian traps (manufactured in Krasnoyarsk by a small, woman-owned company) with Russian pheromone dispensers (produced in Moscow) and later, using a Russian fumigant (also produced in Moscow).

Also, based on a comparison of number of larvae sampled (collected) and moths captured in areas with sparse populations, the Pest Monitoring Component was able to demonstrate conclusively that pheromone traps capture many moths, and in most instances few if any larvae were collected in the same areas. As a result, Ministry officials agreed that sampling of larvae should not begin until the pheromone traps have indicated that populations of Siberian moth are increasing and could represent a potential outbreak.

A second major problem was the size of the area to be monitored. Siberia and the Far East are huge areas—together occupy eight time zones! There was no precedent for monitoring such a huge area. Working with our Russian colleagues in Krasnoyarsk, Khabarovsk and Vladivostok, the Pest Monitoring Component was able to apply a cartographic solution to the problem. The first step was to see if we could develop a map of Krasnoyarski Krai that would delimit areas where host tree species would be at risk from Siberian moth. By using GIS technology, we were able to do this. And consequently, we were able to reduce the total area to be sampled by 70 %. Because this map also showed all of the leskhozes in the krai forest protection specialists could see which leskhozes were at risk to an outbreak and inform leskhoze directors. We then applied a set of formulas developed at the Sukachev Institute of Forest that were applied to stand conditions in those leskhozes which were at risk. Using this technique we were able to delineate the stands into areas of high, medium, or low habitat quality. The high quality habitats were the ones most likely to support an increase in population density. They appeared to occupy less then 7 % of leskhoze territory. This process was repeated in all seven regions that were selected for monitoring. Of the total area of forested land, the Project demonstrated that only slightly more than 200,000 hectares needed to be monitored for outbreak initiation across the vast area of Siberia and Far East.

A third major problem had to do with the planning, organization, and direction of the work for the first and succeeding years. Project documentation required early formation of a Working Group that would be composed of many non-technical people. We felt that non-technical members would be a distraction and that what was really needed was a group of decision-makers representing the Ministry of Natural Resources. Consequently, we asked the Directors of the Centers of Forest Protection for each of the regions taking part in the work to serve as members of the Working Group. We then asked the Chief of the Forest Protection from Insect and Disease Division of the Federal Agency of Forest Management in Moscow to serve as Chairperson. This provided the Working Group with both field and Moscow level decision makers with an ability to understand technical issues and help guide the monitoring effort as it began to unfold.

Methods

Working with our Russian partners, we developed a monitoring system that consisted of the following steps:

- *Forest protection zoning of large areas* – the component team created digitized maps based on forest inventory information for each region we worked in Siberia and the Far East. In addition to distribution of host species, the maps also present information on past outbreaks, leskhozes, and the distribution of various pests and diseases in each host type.

- *Forest protection zoning of Leskhozes (forest enterprises)* – The component team prepared digitized maps of leskhozes using a set of formulas that identified areas of habitat quality and divided them into three levels, high, medium, and low. Areas of high quality represented the greatest likelihood of supporting an incipient outbreak of Siberian moth.

- *Permanent sample plots established* – Each of the Centers of Forest Protection established permanent sample plots in high quality habitat sites in leskhozes in each of the seven regions in Siberia and the Far East.

- *Pheromone monitoring implemented in areas with sparse populations* – Each of the Centers of Forest Protection also placed pheromone traps in and around high quality habitat sites that were in areas of sparse populations of Siberian moth. Trained personnel placed traps in the field in mid-June and retrieved in August.

- *Intensive sampling of larvae* – The Centers of Forest Protection initiated this intensive sampling of larvae only after pheromone traps had detected a significant increase in populations of Siberian moth. The threshold was experimentally determined to be 100 moths per trap.

- *Data base developed* – The Pest Monitoring Component developed a data base at the Sukachev Institute of Forest and used it to process sampling results as well as to prepare outbreak initiation risk maps using the Siberian Moth Outbreak Prediction Model.

- *Siberian Moth Outbreak Model developed* – The Pest Monitoring Component developed the outbreak model, EcoSentinel/SM in the fourth year of the project using information provided by The Sukachev Institute. Component personnel demonstrated the model to the Working Group and then delivered it to Rozlezoaschita and the Krasnoyarsk Center of Forest Protection. Later, the component provided a copy to the Primorski Center of Forest Protection. The project provided a User's Manual in both English and Russian along with an electronic version of the model. The component trained nine individuals to use the model at the three locations.

The Working Group

A key part of our approach was to form a Working Group as soon as possible. The Pest Monitoring Component wanted the Working Group to be composed of real decision-makers. Therefore, we recruited the Directors of the Local Forest Protection Centers in Krasnoyarski Krai, Irkutskaya Oblast and the Republic of Khakassia in the first year. Importantly, we also asked the Chief of the Forest Protection from Insect and Disease Division of the Federal Agency of Forest Management in Moscow to serve as the Chairperson.

We developed a charter for the Working Group that clearly stated:

1. This was a Russian body and that representatives of The Heron Group would be present at meetings only as a resource.

2. All Working Group meetings would be arranged by the Russian Component Coordinator and run by the Chairperson.

3. There would be two meetings each year. One meeting was in October. Its purpose was to review spring sampling results, and based on those results, discuss modifications for the next field season, if needed (this meeting was later changed from October to just before the Advisory Council meeting in December to reduce travel costs for Heron Group

representatives). A second meeting was held in April to review the Plan of Work for the next project year and to make any last minute adjustments.

This format and process worked exceedingly well. The Working Group invited new directors to join the Working Group as the monitoring system expanded to include new regions. Although the first meeting was in Krasnoyarsk, the Working Group held subsequent meetings in all other regions except Tomsk and Buriatiya.

Working Group meetings were formal but usually there was a short, informal field trip that contributed to team building and the development of trusting relationships. Both were extremely important building blocks for subsequent institutionalization of the monitoring system.

Training/Technology Transfer/Education

Another key part of the approach was training, technology transfer, and education. At every location where the Component held Working Group meetings, we set aside a second day for a seminar for foresters and forest protection specialists so they could hear the latest information on monitoring technology from various experts, some from as far away as Moscow. The project also trained attendees in preparing traps for the field and how to use hand-held GPS units. These sessions greatly increased the capacity of the attendees and helped them to understand the importance of their role in developing the new monitoring system.

> "The existing Khabarovsk Forest Protection Station will provide the basis for a local branch of Roslesozaschita in the Kray. Their 3-year association with the FOREST Project during which they worked on Siberian moth monitoring greatly increased their professional capacity and demonstrated that there is no need to look elsewhere for other people to involve in the work of the future Center."
>
> M. Kobel'kov, Director,
> Russian Center of Forest Protection

Leaders of the local Agencies of Forest Management were always very interested in these seminars and supported them both financially and by personal participation.

4. Activities and Significance to USAID

We have limited this section of the report to what the Pest Monitoring Component considers the most important activities. For a more detailed listing of activities and outputs please refer to Section III - Approach. Although not presented in the form of a table they are described in sufficient detail to be fully understood.

Table 1. – Key Activities

Activities	Major Output(s)	Comments on Contributions Toward Achievement of Results	Result(s)
Training Technical assistance	Cartographic -zoning maps -leskhos habitat quality maps	Total area to be monitored greatly reduced resulting in reduced monitoring costs	-Capacity built -Lessons learned -Field monitoring system introduced, tested, and refined

Training Technical assistance	Pheromone traps -laminated traps -pheromone dispensers -fumigant strips	Pheromone traps and their component parts all produced in Russia thereby greatly reducing costs while building new industries	-Capacity built -Lessons learned -Field monitoring system introduced, tested, and refined
Training	Outbreak Prediction Model	Provides a means of predicting incipient outbreaks before they become to large to control. Leads to reduced forest losses and treatment costs	-Capacity built -Lessons learned -Monitoring system and Outbreak Model introduced and refined at National level
Technical assistance	Field Guides	Provides up-to-date information on pests and diseases of Russian forests and how to monitor for them	-Lessons learned -Technology transfer --Monitoring system and Outbreak Model introduced and refined at National level

5. Legacy

Definitions

a. By *"legacies"* we mean those things the Pest Monitoring Component will have left behind when funding ends.

b. We characterize *"legacy mechanisms"* as those means by which these legacies will be sustained after U.S. funding ends. We have used a number of USAID's Eastern Europe and Eurasia Regional Bureau documents to guide development of our definitions and the selection of our legacies.

c. We have added an additional set of information in our descriptions below since we believe it essential to include a brief description of the *"impact"* each legacy will have had and will continue to have after USAID funding ends.

Potential losses (in millions of US dollars) in U.S. forest resources from the introduction of species of insect pests and pathogens from Siberia

Scenario	Pests	Diseases
Best	35 210	295
Worst	60 000	2 254

Source: USDA For.Ser.Misc.Publ. 1495 (1991)

Criteria for Selecting Pest Monitoring Component Legacies

Importance to U.S. - The legacy of the Pest Monitoring Component will greatly assist the US in protecting North American forests from several of the most destructive forest insect pests in northern Asia. Any one of several of these pests, if they were to gain entry to the US. or Canada, could create a situation where it would cost millions of dollars to eradicate them.

Sustainability - The Ministry of Natural Resources will institutionalize the technology

developed by the Pest Monitoring Component and will continue to use it for many years because of its rigor and relevance and the capacity of Russian staff to use it over time. Other public and private sector institutions will have developed capacity to produce needed inputs into the technology for its sustainability and expanded use over time. A critical assumption is that the Russian Federation will have sufficient funding for continued support of this monitoring system.

Impact – The outbreak prediction capability of the monitoring system will provide early warning information that will enable early treatment to reduce spread of an outbreak. This will save the Russian economy millions of dollars in that the total area to monitor will be reduced, treatment costs will be reduced, and timber related losses from the outbreak will also be reduced.

Legacies

Legacy 1: **Cutting edge methodology developed, adapted, and introduced to monitor and to predict outbreaks of Siberian moth across the vast expanses of Siberia and the Far East.**

Impact: Working with the Ministry of Natural Resources from the onset of the FOREST Project, we modified our proposed approach to include "ecological zoning". Within the total area of the Taiga, which stretches across Siberia and the Far East, the Pest Monitoring Component identified and mapped areas of host species where Siberian moth were most likely to initiate outbreaks. Likewise, the component team mapped areas that did not contain host species or were too high in altitude to support development of Siberian moth. The resulting maps showed the total area of host forest that really needs to be monitored. By using this technique the total area was reduced to 32% of the original total forested area. These are not ordinary maps. They also show areas of past outbreaks, when the outbreaks occurred, and how many hectares were destroyed. They also show the location of all Leskhozes in the regions being mapped. The Component team produced maps for Krasnoyarski, Primorski, and Khabarovski Krays as well as for Irkutskaya, Tomskaya. and Sakhalinskaya Oblasts. The Component also assisted the Republic of Buryatia in producing a zoning map for its territory.

Legacy Mechanism: Ministry of Natural Resources.

Legacy 2: **New information and knowledge lead to reduction of area that needs to be monitored, thereby reducing financial and human resource costs**

Impact: The Pest Monitoring Component used information and knowledge accumulated over the years on outbreaks of Siberian moth to further reduce the total area that needs to be monitored. Simply stated Siberian moth habitat in host types is one of three types, high, medium or low, and it is possible to identify these types. Using this information, the Component team mapped several Leskhozes using a set of formulas to identify habitat quality discrimination grid. The resulting maps of the Leskhozes show all of the host types in one of three colors, red (high quality habitat) yellow (medium quality habitat) and green (low quality habitat). Using these colors as a guide, Leskhoze workers can place traps and otherwise concentrate their efforts on the red areas on the maps. More importantly, the area to be monitored has now been further reduced. The maps help the Leskhozes concentrate their efforts and reduce costs.

Legacy Mechanism: Ministry of Natural Resources working with leskhozes.

Legacy 3: **Institutional Capacity of the Ministry of Natural Resources Increased with Outbreak Prediction Model**

Impact: Component developed EcoSentinel/SM, the Siberian Moth Outbreak Prediction Model to facilitate decision making in regard to potential outbreaks. The model processes data on sample information on larvae collected in the field and male moths captured in pheromone traps placed in the field. The model produces maps that locate where there is significant population increase to indicate a potential outbreak of Siberian moth. The Pest Monitoring Component has transferred the model and User's Manual in Russian and English to the Ministry and have trained employees of the Ministry to use the model.

Legacy Mechanism: Ministry of Natural Resources working with Centers of Forest Protection

Legacv 4: **Institutional Capacity of the Ministry of Natural Resources Increased Through Training**

Impact: The component team trained a cadre of approximately 450 Ministry of Natural Resource employees on how to: 1) use modern methods for forest pest monitoring; 2) use hand-held Global Positioning Units; and 3) assemble, place, and retrieve pheromone traps in the forest. These individuals are in the process of training other employees including many that work in the field for different leskhozes. Our plan of "training the trainers" has worked extremely well and has resulted in far more individuals being trained than we could have done by ourselves. We feel that each of these individuals is, in fact, a legacy of the Pest Monitoring Component. Our trained Russian partners in the Ministry now run the early summer pheromone traps by themselves and have done so in seven different regions of Siberia and the Far East.

Legacy Mechanism: Ministry of Natural Resources as well as the trainees who can train others in the various techniques for pest monitoring.

Legacy 5: **Small, Woman-Owned Business with Diversified Product Line**

Impact: The Pest Monitoring Component developed capacity in a small, woman-owned firm in the city of Krasnoyarsk to fabricate the milk-carton type traps that the Centers of Forest Protection now use for trapping Siberian moth. This small firm uses a plastic lamination process that even includes the pre-fold lines. This shop is now receiving orders for traps from other parts of the Russian Federation for other insect monitoring programs in forestry and in agriculture

Legacy Mechanism: Ministry of Natural Resources and Ministry of Agriculture purchasing traps on a yearly basis for use throughout the Russian Federation.

Legacy 6: **Competitive Product Development by the Institute of Chemical Means for Plant Protection in Moscow**

Impact: The component contributed to capacity development in the Institute of Chemical Means for Plant Protection in Moscow when we asked them to produce Siberian moth pheromone for

our work in Siberia and the Far East. The Institute had recently synthesized the natural pheromone for Siberian moth and was eager to field-test their product against a similar experimental product produced in the U.S. by the Agricultural Research Service. As it turned out, the Russian product was at least equal to the American product and much less expensive. We have used this product every year, and each year the Institute adjusted the product to meet our dosage needs. Additionally, and on their own initiative, the Institute developed a slow-release dispenser that is an outstanding improvement over the earlier impregnated rubber hose dispenser. Also, in the fourth year of the project, scientists in this institute developed a new fumigant to kill moths entering the pheromone traps. This fumigant was subsequently approved for use in the Russian Federation.

Legacy Mechanism: The Ministry of Natural Resources and the Institute of Chemical Means for Plant Protection with increased capacity to develop competitive semiochemicals (natural chemical attractants) and dispensers.

Legacy 7: **Development of Forest Protection Field Guides for Publication and Distribution by the Ministry of Natural Resources**

Impact: The component prepared manuscripts for a three-volume set of field guides, Diseases and Pests in Russian Forests. The Ministry of Natural Resources is publishing all three volumes - Diseases of Forest Trees, Insect Pests of Russian Forests, and Methods for Pest and Disease Monitoring in Russia.

A team of FOREST Project consultants from the Sukachev Institute of Forest, Siberian Branch, Russian Academy of Sciences, Moscow State University of Forest and the Russian Center of Forest Protection, the leading experts on forest entomology and tree pathology, prepared the guides. Using these books, foresters can determine pathogens in the field that affect leaves, stems, seeds, and fruits of the most important forest tree species in Russia. They will find detailed information on the major insect pests of both coniferous and deciduous forests and can choose carefully selected methods for pest and disease monitoring and control. Each field guide contains more than 200 full color photos and will greatly facilitate improved identification of damage. The Component targeted the field guides for field staff in the Russian Forest Protection Service. As part of the institutionalization process for the pest monitoring approach introduced by the FOREST Project, the field guides will bring insect and disease monitoring to a state-of-the-art level that should stand for at least 20 years.

Legacy Mechanism: The Ministry of Natural Resources will distribute over 6000 copies of the three volume set of forest protection field guides among governmental, private forest, and nature protection organizations in Russia thus increasing the educational/informational background for forest protection specialists.

6. Lessons Learned and Recommendations

Organization

a) In a project where actual work will be done by country partners and U.S. consultants will have a limited role consisting primarily of technical backstopping and coordination, it is imperative that a local coordinator with impeccable credentials be recruited to actually oversee day-to-day coordinating activities.

b) Plan, organize, and hold Working Group meetings that bring together partners and stakeholders to achieve early buy in. Be sure that decision makers are included if the Working Group will be making decisions rather than just sharing information. If possible, try to have a chairperson who is more senior/respected than any of the members. Finally, appoint someone in the project to be responsible for planning the meetings, arranging logistics, and recording outcomes.

c) Projects having cross-cutting components such as grants/loans, policy and legal reform, and applied forestry research should be avoided unless the intent is assist the main thrust of the primary components in the project. Cross-cutting components tend to take on a life of their own and in so doing often siphon off valuable resources that can have greater utility if administered through the primary components.

Teamwork
Teamwork in a project where there are one or more subcontractors requires a concerted team building effort on the part of the prime contractor if it is desired. Early meetings to foster teamwork should be held and continued throughout the project. Effective teamwork is a direct result of a concerted effort by prime contractor leadership to set the standard for an effective team and to provide support for team building throughout the life of the project.

Administration
All administrative activities should be assigned to a local administrative office that will provide support to the technical coordinator(s). This support should include contract/agreements management, procurement, disbursement of funds, and management of accounts.

C. Component 3 - Non Timber Forest Products and Secondary Wood Processing

1. Introduction and Component Goal

Russia holds more than 20% of the world's forests and has significant environmental as well as economic importance to the global community and specific importance to the United States. The Taiga ecosystem is home to endemic flora and fauna found nowhere else in the world, with the Amur tiger one of the best-known examples. There are countless other species endemic to this ecosystem. These are important within the context of global biodiversity, and can provide economic value through sustained harvesting, and best practices for the forestry industry as a whole. Yet, these forest resources are threatened by natural causes, as well as human intervention – primarily high grading and unregulated harvesting.

The forestry sector is vital to Siberia and the Russian Far East as it represents 5% of all national exports, and 2% of GDP. Forestry sector growth and its importance to the economy can only be compared with the oil sector. However as a resource, Russia's forests represent a long-term sustainable sector for job growth, improving life and standards in rural villages, and reducing unemployment.

The forest products industry in the Russian Far East and Siberia, comprising both timber and non-timber products, is faced though with a series of challenges and constraints as a result of the political and economic changes in the past 15 years. Falling producer prices, outdated equipment, lack of capital investment, escalating transportation costs, a heavy tax burden, and a declining ability to compete in international markets resulted in accelerating harvesting rates to meet current cash requirements. The Non-Timber Forest Products and Secondary Wood Processing (NTFP and SWP) Component of the FOREST Project addressed the challenges of increasing forest based industries revenues and profits to encourage re-investment in sustainable forest management practices. This component also set as its goal to increase the economic opportunities of communities and entrepreneurs working or living in the forest - the majority of rural inhabitants in the Russian Far East.

A significant amount of Russia's timber products are exported in a raw form. This not only promotes increased harvesting, but it also hurts the Russian economy. Jobs are lost to companies that could process the timber, and manufacture components and finished products. The potential of increasing employment and earnings for Siberia and the Russian Far East is through sustainable harvesting and by increasing value added processing.

The goal of this component was to assist the industries to increase the value of forest products as a way to reduce the export of raw products and to discourage over-harvesting of forest products, to increase jobs and income for Russians and to engender stewardship of the harvesters. The component's main focus was on two sectors – non-timber forest products and secondary wood processing – and work through associations. The goal that the component set was to increase the value of products harvested per hectare by 5% in the areas worked. Sub-indicators were broken down with respect to two target groups: the associations and their members.

Associations:

- NTFP and Secondary Wood Processing Associations economically self-sufficient and sustainable (defined as able to cover annual operating costs from membership and service fees and grants)
- Increased membership supporting associations through payment of annual dues or other service fees
- Increased services provided to members

Member Clients:

- Increased value of forest products per cubic meter harvested in targeted areas
- Increased income/profit per unit harvested
- Adoption of new or more efficient technology
- New loans or investment secured (dollar value)
- Improved quality (measured by ability to meet export quality standards)

- Increased export sales
- Adoption by NTFP processors of mechanisms (quotas, permits, or fee systems) that preclude the use of resource depleting harvesting practices

To achieve this, FOREST strengthened associations to represent and serve their members and help increase the value of their products by increasing efficiency, producing marketable products, and adding value to their products.

The priority of this component was to build the capacity of the associations and assist the businesses to add value to their products. It was assumed that FOREST could reach a greater number of beneficiaries through working with wood and non-timber forest products associations than working with individual companies, since associations represent a practical depository for skills, knowledge, and linkages. Associations presented a sustained delivery mechanism of the technology and knowledge that the FOREST Project brought.

To achieve project goals and objectives the following approaches were used:

- Problem identification
- Assessment of the problem
- Prioritization of the greatest obstacles to achieving component results
- Providing a variety of technical assistance (e.g. workshops, seminars, individual consulting and etc.)

The component had a three-tired approach:

- Strengthen associations
- Strengthen businesses (both association members and non-members)
- Provide information and assistance that can benefit the entire sector

2. Summary of results and impact

Overview

During the five years of FOREST activity our partners have been able to expand their product range, increase their profit, reduce wastes, install new production lines, find new markets for their products, establish contacts with foreign customers and investors, improve the quality of their products and increase their competitiveness in international markets.

FOREST partner associations have been strengthened. Fifteen seminars were conducted to strengthen and ensure the sustainability of associations, by training them on governance, providing services, advocating and seeking funding. FOREST partners shared their knowledge and experience with other associations. The share of expenses for the participation by NTFP companies in trade fairs has gone up to 50%, while SWP companies covered 100%. By the third year the number of member companies within partner associations was up by 54% and 25 companies improved their economic performance.

The project conducted over 38 trainings and seminars where 761 persons were trained in such areas as operating dry kilns and boiler equipment, wood drying technology, organic certification of NTFPs, preparation of cutting tools, and strategic planning and association administration.

Detailed studies of foreign markets have been performed corresponding to the needs of small and medium sized forest sector companies.

The Project facilitated 224 participants to attend 26 trade fairs both in Russia and abroad and made it possible for our clients to negotiate contracts worth over $3 million USD, be introduced to foreign markets' standards, and find new partners in US, Europe, Hong Kong, China, Japan and Russia.

FOREST provided assistance to 124 companies. With project support four new companies have been established; 15 expanded their product range, and several are in the process of negotiations with partners from Europe, China, Japan and the USA discussing the possibility of setting up joint ventures to produce lumber, MDF, glued panels, dried lumber, as well as packaging and marketing food products and food supplements.

NTFP buyers from the U.S. and Asia showed an increased interest in Russian products especially in connection with possible organic certification. Buyers of high quality wood products from Japan and the U.S. also showed interest in Russian suppliers, because of good product quality, terms of delivery, and reliability of the FOREST partner companies.

The following is a detailed description of the results and impacts divided into three areas: support of associations, member companies, and the forest sector.

Supporting Associations

The project worked through associations as a means to increase their sustainability so that they would be capable to use and disseminate knowledge and information developed by the project after it closed thus benefiting their member companies and building civil society in Russia. FOREST therefore worked with partner companies primarily through the professional associations, strengthening them organizationally, increasing their services, and building their institutional capacities. With FOREST direct involvement three associations have been created (two in Siberia and one in Sakhalin).

With most FOREST events conducted with the direct active involvement of the associations, a by-product of the project was that the associations were promoted and recognized by the regional administrations and the business community. By increasing the status of the associations, the program made the associations more effective.

a) Training

During the five years of the project associations and their members received FOREST support through participation at international and domestic trade shows, studies of local and foreign markets, 38 seminars on strategic planning, administration, and association sustainable development as well as specialized seminars in NTFP and wood processing. The first two years of the project were aimed at development of partner associations. Considerable changes in terms of sustainable development of partner associations were possible due to support and technical assistance provided by FOREST including:

- Developing strategic plans for the associations

- Establishing a database including all the members of the associations
- Developing web sites for the associations
- Organizing and developing annual meetings
- Training association leaders and members at seminars and workshops where such issues as association management and administration, strategic planning, and advocacy as well as technical issues were discussed

Winrock consultants and volunteers developed strategic and action plans for each association. These plans proved to be very effective in forming and strengthening new associations. FOREST supported the development of websites for all the associations with both Russian and English versions. These web sites assist associations and their members by informing potential customers about their services and available products. The websites are also extensively used by the associations to inform their members about future events.

All chairmen, executive directors and board members of the associations underwent training in the U.S. during study tours and trade missions as well as at various seminars and workshops where such topics as association management and administration, financial management, strategic planning, advocacy, fundraising, presentation skills, and expanding services for member companies were discussed.

Practically all seminars were conducted by Winrock volunteers. As a result of active participation of association representatives in workshops and study and trade tours organized by FOREST, the associations were able to fully represent their association members and their products.

Thirty-six trainers who work with associations were trained on various technical issues such as wood drying, wood-glued components and organic certification. Associations are now able to offer fee-based training to its members, and to expand the range of services rendered to its members. The new services include: a) assistance in obtaining export licenses, b) collaboration with local administrations, c) follow up on the business contacts, developed at international and national trade shows, d) information support, and e) fundraising.

b) Interregional Cooperation

FOREST facilitated the development of interregional cooperation within the sectors. In the highly competitive forest products industry, Russian companies and associations have been reluctant to share any information or expertise that could be seen as helping their neighbors. While this problem remains, FOREST assistance has helped some to realize their true competitors are international, and begin to collaborate toward strengthening the sector overall. For example, having received training in strategic plan monitoring, association management, and fundraising development, the Region 7 Association through a volunteer assignment passed this training on to the Krasnoyarsk NTFP Partnership. The RFE SWP Association, through its close links with the Khabarovsk Technical University, sent experts to assist two Sakhalin Forest Products Producers Association members in waste utilization and value-added processing, and also hosted March's "Kiln-Drying and Boiler Technologies" seminar which attracted participants from Khabarovsk, Krasnoyarsk, Primorski and Sakhalin. Several NTFP companies have begun

collaborating to fill export contracts, gained through trade show participation, that are too large for any of these companies to fill individually.

Association representatives were presented with an opportunity to participate in trade and study tours. FOREST facilitated and supported participation in 28 study/trade missions (13 abroad) and covered 100% of all the expenses. Such participation made it possible to represent the interests of all association members.

Joint participation at trade shows, study tours, seminars and workshops has allowed the companies to come together, identify and discuss specific problems facing the sectors, define their own needs, and determine how they can exchange their experience and cooperate. All this led to the creation of the Siberian Interregional Association of Natural Products Producers which united associations and companies from Tomskaya and Irkutskaya Oblasts, Krasnoyarski, Altay and Khabarovski Krais and the Republic of Khakassia. Association members have come to realize that only joint efforts on an interregional level can help them find solutions to many problems facing them. The formation of the interregional association made it possible for the companies to jointly address the economic problems they face. It facilitated products and expertise exchange between the members and made the process of entering other regional markets easier.

c) Association Membership

During the initial stage of the project there were 115 member companies in six associations. The results of Years 2 and 3 showed an average increase in membership of 54%, or 62 new members. During the same period the beginning of qualitative changes in the organizational and membership structure of the associations was noticed. Despite the gradual decrease in quantitative indicators by the end of the project when the membership dropped by 33% (currently 119 companies are members of six associations), qualitative indicators have undoubtedly improved:

- Practically all the members pay membership fees on a permanent basis, earlier fee collecting was one of the major problems.
- The amount of the fees collected has increased on the average by 30%.
- The associations earn by providing more paid services to their members, through grants and funds from federal and regional budgets to implement specific projects.

There was a decrease in members when associations refused membership to those companies that did not pay fees, were passive, and did not attend annual meetings. Associations are now able to spend more time working with active members who are interested in sustainable development of their business and the forest sector as a whole.

FOREST support has positively affected the role and image of the associations. Below are some examples:

- The creation of the Siberian Wood Processors Association in 2002 was FOREST's first attempt to organize the companies within the industry. The association though young proved to be very effective and participated in the development of Krasnoyarski Krai

program "Conception and Major Directions for the Development of Krasnoyarsk Forestry Sector for 2004 -2015". Association Chairman, Mr. Bezmaternykh, was the one who organized his members to participate in trade shows and study tours, arranged by FOREST. He also played the key role in arranging the visit of foreign businessmen to Krasnoyarski Krai. His active role and attitude to the development of the forest sector was noticed by the krai administration. In 2004 he was invited to head the forest industry at the krai administration.

- Siberian Interregional Association of Natural Products Producers and Siberian Wood Processors Association initiated and took active roles in the development of territorial programs such as "On the Development of Harvesting and Processing of NTFPs in Krasnoyarski Krai for 2004 -2010" and Krasnoyarski Krai law on Harvesting, Processing and Export of NTFPs. Siberian Wood Processors Association proved to be very active and efficient in assisting FOREST in organizing the reverse trade tour to Siberia.

- Far Eastern Association of NTFP Processors was involved in the development of Rules of Forest Fund Usage to Harvest Secondary Forest Resources with the Purpose of Obtaining Natural Vegetative Products of Khabarovski Krai, and introduction of the rules into sustainable forest use practice. The Association also played a critical role in developing the concept and creation of territorial NTFP harvesting and processing center of Khabarovski krai indigenous peoples.

- The Far Eastern Wood Processors Association has started its own publication and advocates actively for wood processor interests in the Krai duma.

Support to Member Companies

a) Assistance production development.

The project assisted in evaluating and assessing new production, conducting feasibility studies, and developing business and strategic plans. Winrock volunteers developed seven feasibility studies for *Severles, Vakhrushevsky DOK, Forest Line, Standard Les, Kik Taseyevo, De Kastry Les* and the Khabarovski Krai Forest Industry Ministry. FOREST helped develop16 business and strategic plans as well which resulted in the establishment of four new companies- *Dynasty, Vostokbioproduct, Severles* and *Nord Baikal*. One of them, *Dynasty,* is being equipped with up-to-date equipment capable of producing high quality processed wood products able to compete in international markets. The overall costs to build the production facility amounted to 7 million US dollars.

Illustrative Example:

LLC Dynasty (Khabarovsk), as the result of working with two FOREST volunteers set up a new production line for laminated panels. Within one year the company installed a sawmill, a 100 cubic meters dry kiln complex and a one megawatt boiler utilizing waste. After visiting the Ligna trade show in Hanover, the company bought a finger joining line and equipment worth $750,000 USD to be able to produce finger joined edge-glued laminated panels. The company's employees were trained to operate the boiler and received technical assistance from the Biomass Energy Component engineers on boiler installation. The boiler will use wastes generating heat both for the premises and dry kilns which are capable of drying 5000 cubic

meters of lumber per year resulting in $130,000 USD as added value annually. This will save the company about $10-20,000 USD per year as there will be no need to bury the waste. LLC Dynasty is a dynamically developing company. At an opening ceremony in September 2004 the deputy minister of Khabarovski Krai forestry industry Mr. Pankov, gave a high appraisal of the company. In January the company participated at Surfaces 2005 trade fair in Las Vegas and succeeded in negotiating a contract for the delivery of its product.

b) Assistance in adding value to products

FOREST consultants and volunteers introduced modern technologies and assisted in searching for new up-to-date equipment. This resulted in the following:

- 27 new production lines and new technologies introduced
- 74 new product developed
- Licenses and certificates for 28 new products obtained
- Equipment worth 5 million USD purchased

Illustrative Example:

The Indigenous People's NTFP Center was established at the Forest Products Company facilities in Khabarovsk. The company was specially commended by the Ministry and was awarded a Letter of Appreciation for its contribution to the preservation and development of the unique NTFP processing business in Khabarovski Krai. FOREST Project can claim credit for a large part of Forest Products success. In his speech at the meeting the Forest Products Company Manager Mr. Khrustov specifically mentioned that attending the international trade shows in Hong Kong, Tokyo and Anaheim (that had become possible due to FOREST sponsorship) generated a lot of interest in his products and, more importantly, allowed him to understand the up-to-date trends in the industry worldwide and the existing opportunities to upgrade and expand his business. Of the more than 40 kinds of products that the company manufactures 15 were developed with the help of FOREST consultants and volunteers. The promotional campaign on the Vita Mishka series of products that was developed with FOREST funding, dramatically increased company sales and gave national recognition to the desserts, jellies and jams. With FOREST support the company succeeded in obtaining a 13,000 ruble loan from the Khabarovsk Fund of Entrepreneurs to procure a line to manufacture and package three new products: wild berry juice concentrate, jam and dessert. Forest Products is in a good position to serve as an umbrella company for the numerous NTFP harvesters as it has been exposed to the latest developments and trends in the industry by participating in the FOREST-arranged workshops and seminars on organic certification, packaging and business presentation, international market requirements, and product promotion. Its personnel can now share their extensive knowledge with other companies.

Illustrative Example:

With the purpose of assisting Commodity Trade Trans, FOREST provided a Russian volunteer to initiate operation of a four side molding machine that the company

bought recently, allowing the company to process low grade boards that were sold earlier at lower than production cost. Now the same boards are used to produce high quality end products such as flooring, door frames, and molding. The company has been active at FOREST organized workshops and trade shows, and the company's director participated in the Japan trade mission which resulted in a decision to buy new equipment. The company director is the Chairman of the Sakhalin Association and actively supports the wood processing industry in Sakhalin. On his initiative FOREST conducted market research in Sakhalin and developed a lumber yard business model.

Illustrative Example:
LLC Malakhite (Siberian Secondary Wood Processors Association, Krasnoyarsk) is actively upgrading its production and taking part in various workshops, trade fairs and study tours organized by FOREST. The company was extensively assisted by two national volunteers to develop a strategic plan and a website. They also assisted in improving the technology of a three layer gluelam square board manufacturing system, thereby increasing sales and product quality. As a result the company's production has increased by 15% and company's profit has increased by 25%. Sergey Kartin, General Director of the company, took an active part in the study tour of Russian wood processors to the U.S. west coast. LLC Malakhit greatly impressed the participants of the reverse trade tour, all of them admiting that the company though small, pays due attention to product quality.

c) Assistance in increasing sales and products promotion
FOREST has conducted 15 market studies in the interests of specific companies and sectors as a whole. It also assisted in developing effective marketing tools which include:

- development of 47 company profiles and product sheets;
- development of 31 new packaging designs;
- and, development of effective presentation and international negotiations skills.

The Project assisted in expanding existing markets both at home and abroad and facilitated access to international markets. FOREST provided significant assistance to 124 companies in the NTFP and SWP sectors. The most effective assistance was offered to 25 NTFP processors and 27 wood processing companies.

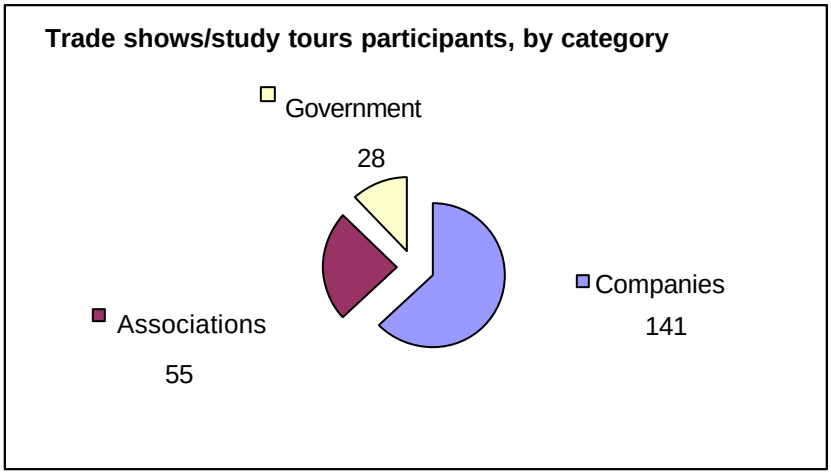
In all its activity FOREST extensively used both foreign and Russian specialists. 80% of those performed their missions on a voluntary basis, providing individual consultations, trainings and workshops for partner associations and member companies. In total 184 volunteers (120 Russian and 64 US) provided consultations and conducted trainings for 87 companies.

d) Preparation and sending delegations to trade/study tours
One of the major component activities designed to expand existing markets was to participate in regional, national and international trade fairs. The major goal was increased product sales, complementary objectives were:

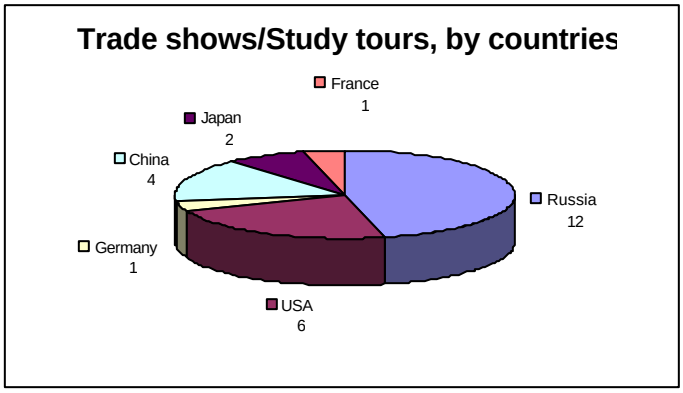
- *Market training* to build Russian producers' knowledge of foreign market requirements, product specifications, customs and import requirements, regulatory issues, etc.

- *Developing a market network* of contacts for continued communications, training, and follow-up visits to Russia by foreign buyers.
- *Training in modern technologies* for processing, handling, and packaging, as well as company practices, marketing and promotion.
- *Training in association and regulatory issues* by visiting trade associations to learn about their role in marketing and promotion, market information sources, and regulatory compliance.

During the life of the project, FOREST secured participation of 141 company representatives at 26 trade shows in Russia and abroad.



Out of 26 missions 16 were NTFP and 10 SWP oriented. Years 3 and 4 had the most trade missions. Almost half of the shows (46%) were held in Russia and 23% in the U.S. Our partners also had a chance to travel to China, Japan, Germany and France.



It should be noted here that participation at trade shows was not only a marketing effort but training and education as well, since the participants gained the experience of working with foreign customers, developed the art of promoting their products, as well as honing their presentation and negotiating skills. They also learned the specific requirements peculiar to international markets. Such participation allowed the companies to expand the geography of

their markets, finding new markets both in Russia and abroad. Some of the products were awarded medals and Diplomas which raised companies' prestige and reliability, developing trust with their clients. Partner companies have succeeded in negotiating sales contracts worth 3.3 million USD. Government representation on the tours was essential as it showed how they could increase economic development in their krai by investing in the forest sector.

Illustrative Example:
In 2004 FOREST, following the latest world trends of soaring natural and organic product markets, organized two study tours to the U.S. for NTFP processing companies, government officials, and Siberian and Far Eastern associations. The participants had a unique opportunity to visit two major international trade shows: Natural Products Expo West 2004, which took place in Anaheim, California and the Natural and Organic Products Expo East 2004 which took place in Washington, D.C. In total there were 13 companies participating in the tours, the Chairman of the Indigenous People's Association from Sakhalin, and six government officials from Siberia and the Far East.

These trade fairs are two of the world's largest. There were about 2000 registered exhibitors and 3000 attendees from 80 countries including 13,000 retailer/buyers, looking for latest and most promising food, supplement and raw material products.

Russian Natural Products received extensive attention from the show organizers and attendees. More than 50 companies showed direct interest in the products from the Russian Far Eastern and Siberian forests. To give international buyers an insight into the Russian natural products market capabilities, two presentations were delivered by Russian NTFP Association representatives at the 'Global Dispatch – Russia' session.

During the Trade Show the Russian delegation attended about a dozen seminars on such important topics as organic certification, marketing, consumer education, and legal and scientific requirements for entering new products into the U.S. market. The delegation also had a chance to a get first hand experience and knowledge in the course of the NTFP study tour throughout the Pacific Northwest while visiting natural products suppliers, retailers, producers, and manufacturers. Such well established corporations as Golden Temple (herbal tees, essential oils, and food natural products producer), Celestial Seasonings (America's largest specialty tea company), Aveda (a manufacturer of organic/sustainable hair, body care and beauty products), as well as smaller specialized natural product companies, Trout Lake Farms, Mycological, Himalayan Tees, have shared their expertise in best manufacturing/management practices, and provided tours through their storage and production facilities.

As a result of the mission, Russian companies displayed their products and developed tremendous interest in Russian all natural products with immediate request for sales in the United States. At one point the booth was under siege. It was recommended that the products be consolidated and warehoused in the U.S. A U.S. businessman has expressed his will to invest his money to set up this warehouse. This fact will stimulate Russian producers to certify their products organically. While there,

mission delegates met with the U.S. Forest Service, U.S. Department of Commerce, Senator Jim Jefford's office, and the First Nations Development Institute (American Indigenous Peoples). At a meeting with the U.S. Forest Service, Krasnoyarski Krai Vice-Governor Gnezdilov was promised assistance in the development of a krai level NTFP long-term development strategy, based on a similar strategy developed for the United States. Additionally, the mission created a direct link between the First Nations Development Institute (FNDI) and the Sakhalin Indigenous Peoples' Association with the FNDI offering assistance in collaborating with oil and gas development projects on Sakhalin to benefit local indigenous peoples. First Nations is seriously interested in forming a 'First Nations Russia'. They offered training in the U.S. to two people from a host indigenous organization in Russia. They are earnest about collaboration and offer some impressive models for leveraging resources for indigenous causes.

e) Assistance in waste utilization

FOREST promotes wood waste utilization thereby improving environmental performance. Cost-effective utilization of small diameter logs and low quality wood remains a persistent problem in the RFE. At the request of Sakhalin-based *Parusnovskiy DOK*, FOREST sent a volunteer from the RFE SWP Association to make recommendations on increasing production through the minimization of waste. The expert suggested modern technologies to use more of the raw material and proposed a strategic plan for immediate improvement. As a result, lumber output has increased by 10% and waste slabs decreased by 8%. Later, *Parusnovskiy DOK* won a grant from FOREST for a feasibility study to install a 400 kW biomass boiler to provide heat for the production facilities and dry kilns. *Parusnovskiy* represents a growing sentiment among socially conscious companies in the RFE: in order to produce a higher-value product and conserve Russia's forests for future production, maximum capture of wastes must be the goal. Only in this way will the forestry sector continue to provide jobs and tax revenue for decades to come. The RFE SWP Association has also been a leader in this effort, not only through inter-association collaboration such as that described above, but also by conducting a study and seminar on small wood utilization on behalf of the Khabarovski Krai Administration.

f) Assistance in accessing finance

East Sakhalin Wood Production Company, with a business plan supported by a Russian volunteer, obtained a $50,000 loan to reconstruct facilities and kilns and increase production volumes. *Voyage* Company also used its volunteer-drafted business plan to apply for finance to buy wood processing equipment the company identified while visiting the Ligna Plus trade show in Hanover.

To clarify the results of support to member companies, the NFTP and SWP Component analyzed 15% of our partner companies and proved that all economic indicators rose. On the average sales increased by 132%. This fact can be accounted for not only by the improvement of the economic situation in the country, but also by intensive FOREST support. The following factors significantly influenced the sales increase:

- New sales contracts have been signed at trade fairs and participation allowed companies access to new markets.
- Development of websites for the associations and partner companies gave potential customers information about companies and their products.

- Development of new products and brands, and expanding existing product ranges.

Companies' profit also rose on an average of 95%. Labor productivity grew by 165% for the period 2000-2004. This increase can be accounted for by new equipment and introduction of new technologies developed by FOREST volunteers. Successful development of existing ventures and setting up new ones resulted in new jobs. Each company on the average was able to hire 11 new employees. A total of 660 permanent jobs were created with a payroll of $2,184,828 per year (additional budget payments amounted to $ 1,066,196). Company financial investments in production averaged $685,414 during the five years of project implementation. The companies' actual value increased more than fourfold as opposed to the investments in their establishment.

Support to the Forest Sector

a) Extensive research of potential markets
In a limited amount of time FOREST successfully assessed the current market situation both nationally and internationally. Nine market studies for NTFP and wood products have been prepared and disseminated among our partners. Ten market studies have been implemented in the interests of specific companies.

b) Collaboration with government bodies in the region
FOREST closely coordinated its activity with corresponding agencies such as government ministries and departments. Below are some examples:

- *Assistance in the development of local legislation, aimed at securing sustainable NTFP harvesting.* FOREST assisted Far Eastern association of NTFP processors in cooperation with scholars and the government in developing new rules, regulating the manner and norms, timeframes, and amount for sustainable NTFP harvesting. These rules were put into practice by the Khabarovski Krai Governors Decree #128 as of May 14, 2004. At the request of Sakhalinskaya Oblast administration FOREST assisted in developing a long-term program of sustainable use of Sakhalin NTFP resources. And, as noted before, close cooperation between the Krasnoyarsk Winrock International field office and the krai administration on these program developments - "Conception and Major Directions for the Development of Krasnoyarsk Forestry Sector for 2004-2015", "On the Development of Harvesting and Processing of NTFPs in Krasnoyarski Krai for 2004-2010", and Krasnoyarsk krai law on Harvesting, Processing and Export of NTFPs should be noted again as significant impacts on local legislation.

- *Assistance in dealing with regional problems.* At the request of the Khabarovski Krai Timber Industry Ministry FOREST organized conferences on wood drying and wood-framed house construction, conducted research on dry kiln equipment, and provided training for NTFP harvesters explaining the new Rules. At the request of Sakhalinskaya Oblast Administration, a Japanese wood market study was conducted and a business model for a lumber yard was developed.

- *Stimulating foreign investments.* One of the most important tools to attract foreign investments became participation in international conferences, study and trade tours

where the participants informed foreign businessmen about the Russian investment climate. Visits of foreign wood processors to Siberia presented a good opportunity for that purpose. At numerous meetings held in Krasnoyarski Krai and Irkutskaya Oblast, the participants were presented with investment projects, climate and opportunities. During the visit the possibilities of setting up joint ventures were also discussed. Several companies requested a trial shipment from Siberia to evaluate transportation routes and other logistic issues. At the same time foreign businesses are evaluating the possibility of joint ventures with the Russians with a number of joint projects currently under consideration.

Illustrative Example:
Winrock International together with R E Taylor and Associates organized and conducted a Reverse Tour for forest industry sector foreign companies to Krasnoyarski Krai and Irkutskaya Oblast. The idea to organize this Reverse Tour appeared as the result of the Study/ Trade Tour of Russian Wood Processors to the U.S. There were 17 representatives from the largest forest industry companies in the U.S., Canada, Australia, Germany, Chile, and New Zealand. For two weeks the tour participants visited 21 forest industry enterprises in Krasnoyarski Krai and Irkutskaya Oblast and met with top managers, evaluated the technology and product quality as well as asked hundreds of questions on resources available, licensing procedures, and production and transportation costs.

Foreign businessmen greatly appreciated an opportunity to participate in round table discussions organized by territorial, municipal and district administrations.

Altogether the delegation had a chance to meet with two vice governors, four mayors and four heads of district administrations. Government officials together with the representatives from banks, transportation, tax and customs authorities, as well as businesses presented a wide spectrum of opportunities for foreign investors and provided comprehensive answers that helped to eliminate some of the participants concernsregarding possible risks.

Woodgrain Millwork, the largest molding and doors producer in the U.S. proved to be one of the most enthusiastic participants. The company placed an order for a trial shipment of red pine lumber and during the visit had a chance to inspect the quality and actually helped to grade and sort the lumber since Russian manufactures are not yet familiar with U.S. standards. Woodgrain Millwork has proved their serious intentions of doing business in Siberia by hiring two employees in Krasnoyarsk and Irkutsk territories. One of them was included in the delegation for training purposes and later sent to the U.S. for further training. Woodgrain Millwork has signed a $1 million USD contract with PIK 89 company from Irkutskaya Oblast for delivery of finished products.

Illustrative Example:
In November 2002 FOREST organized the participation of government and association representatives at Sino-Russian wood trade and investments conference in Beijing. The conference was followed by a business meeting of numerous Chinese companies and Russian SWP representatives. Mr. Seluga, who represented

Khabarovski Krai Timber Industry Ministry, had a productive meeting with the Shengyang Heavy Machine Building Corporation. Eventually this meeting gave birth to a very exciting project. As the Ministry reported recently, the Chinese businesses agreed to create two joint ventures, and two agreements were signed to construct MDF manufacturing plants. One plant producing 80,000 cubic meters of MDF will be located in Komsomolsk on Amur, another producing 100,000 thousand cubic meters of MDF in Khabarovsk. The cost of the first project is 21.6 million USD with 50/50 participation, whereas the cost of Khabarovsk project will be 30 million USD with 10% Russian and 90% Chinese capital . Thus this FOREST organized activity resulted in the creation of two joint ventures worth 51.6 million USD, and helped to attract 37.8 million USD in foreign investments. It is too early to predict how many jobs these ventures will create but the amount may far outnumber 300.

- *Study tours.* When organizing study/trade tours FOREST considered it appropriate to include representatives from the regional administrations in the delegations. Their participation in such activities would provide a good chance to understand the forest sectors in their regions. A total of 28 representatives from regional administrations participated in 24 tours abroad.

c) Assistance to indigenous people

FOREST was actively involved in promoting indigenous populations in the regions, through cooperation and teamwork with associations and administration departments, providing support in business development, training, and assistance in setting up Khabarovski Krai's Indigenous People's NTFP Harvesting Center.

The head of the indigenous people's department of the Khabarovski Krai administration and the Chairman of Sakhalin indigenous people association were included in the delegation that visited Expo East 2004 trade show in Washington D.C. During the tour they were able to establish contacts with First Nations Development Institute with the purpose to develop mutual exchanges and joint participation in mutual projects.

In cooperation with Sakhalin Indigenous People Association, a study on the potential of involving indigenous people in NTFP harvesting was conducted. As a result, more than 100 representatives from 13 communities participated in workshops where they were trained in sustainable NTFP harvesting and processing. In 2004 Khabarovski Krai communities were able to harvest 58 tons of fern and one ton of Siberian ginseng.

Project volunteers assisted in adjusting a dry kiln for *Amur* indigenous community and developed new packaging designs for NTFP products. Companies interested in the packages placed orders directly with the indigenous communities.

FOREST has provided significant assistance in the establishment of the Indigenous Peoples NTFP Harvesting Center in Khabarovski Krai. The project funded the center to develop its own website and a video on the center's activities. This will further assist the center in promoting its activities, increasing sales, and as a result more indigenous communities will be involved in NTFP harvesting. FOREST supports the Center in conformity with the Federal Program of the Indigenous People's Support

d) Sector based seminars

FOREST facilitated and sponsored 38 seminars and workshops with 761 participants. Participant breakdown was 85% from businesses and 13% were association managers. Of the total, 39% of the seminars were devoted to association development, 37% to the NTFP sector, and 24% to the SWP sector. It should be noted that during the first two years the seminars were aimed at strengthening the associations, whereas later the subjects focused on sector development, i.e. NTFP and SWP.

Illustrative Example:

Khabarovski Krai Timber Industry Ministry is extremely concerned about log exports and does everything possible to stimulate sawmilling and wood processing in the region. One of the options is to develop a local lumber market. With this in mind the Ministry approached FOREST to assist in organizing a conference for wood-framed house construction. Construction of wooden houses might create a significant niche for structural lumber on the market, whereas currently it is extremely insignificant or does not exist at all. Construction of this house type is in full swing in Sakhalin with oil and gas companies being major contractors, there is some in Primorski territory, but none in Khabarovski Krai. In cooperation with ESD project, the Far Eastern Association of Wood Processors, and the Ministry, FOREST developed the conference agenda, identified participants and invited Canadian and Russian volunteers who had significant knowledge and expertise on wood-framed house construction. The issues discussed at the conference attracted not only wood processors from the region but banks, ministries, municipal and krai government officials as well.

The conference promoted North American expertise in Khabarovski Krai and boosted the demand for locally manufactured lumber and wooden components to address the housing problem.

During a visit to the indigenous community Amur, a FOREST partner, the conference participants were given an opportunity to realize that most of the materials are available locally and that these houses prove to be extremely energy efficient. The Khabarovski Krai Governor considered the conference resolution and supported the development of wooden housing construction. The seminar that FOREST organized in Sakhalin bore fruit immediately. A large foreign construction company placed a long-term order for structural lumber with a FOREST partner company.

Illustrative Example:

As Khabarovski Krai Timber Industry was challenged by the Governor to ensure that the krai expand its kiln drying capability to 400,000 cubic meters of lumber per year within 2003 – 2008 period, the Timber Industry Ministry approached FOREST Project with a request to help organize a kiln drying seminar for krai wood processors. Based on that request FOREST provided funding and logistic support for the seminar. It expanded the geography of the seminar participants by inviting clients from the partner SWP associations in Krasnoyarski Krai, Primorye and Sakhalin in addition to companies from Khabarovski Krai. The Far-Eastern Wood-Processors Association (DOD) joined FOREST and the Ministry's efforts by donating space and

assisting in sending out invitations, thus securing an impressive turnout (the total of 65 participants). The DOD Chair acted as the seminar facilitator.

The seminar was devoted to reviewing and discussing the current status of kiln drying technologies in Russia and the most promising trends in that area, as well as actual methods of drying specific species, larch wood in particular (that part was covered by renowned researchers from Moscow, Khabarovsk and Krasnoyarsk, recognized authorities in the field, the fact that was specifically appreciated by the trainees). The seminar was planned in such a way that with the researchers' presentations, the audience had a chance to look at the problem from a manufacturers' perspective who had been operating different kinds of dry kilns, as well as from the international buyers' perspective (that of IKEA and Japanese buyers). The kiln drying issues were also looked at from the viewpoint of utilizing wood wastes to heat the kilns – at this point an introduction to the Biomass Energy Component experience was appropriate and aroused a lot of interest. The seminar not only offered various kiln drying options but also suggested potential funding sources. The USAID 'Credit Guarantee Program for Development" was introduced to the participants. Such funding institutions, as the 'Delta-Lease- RFE', 'Regiobank', the Bank for Foreign Trade, and the Bank of Moscow described how they fund forestry projects and offered their services to the companies represented at the seminar.

Day two was spent on site visits. The trainees visited Khabarovsk companies that use different kinds of dry kilns. They had a chance to hear about pros and cons of using various kiln models and get practical tips from those operating them.

FOREST received special thanks from the 1st Deputy Timber Industry Minister Mr.Pankov who rated the seminar very high in terms of it usefulness and organization. Individual participants from Primorye, Krasnoyarski Krai, Sakhalin and Khabarovsk emphasized the expertise of the presenters and the depth of their knowledge. They expressed special gratitude to FOREST for having given them an opportunity to learn a lot and to communicate with the researchers and other manufacturers.

The seminar has already reaped results, such as Terneiles Company has arranged for its Chief Engineer and Technologist to visit with Professor Mansurov of the Siberian State University in Krasnoyarsk to learn more on how to dry larch properly and has applied to FOREST for sending the professor to Terneiles as a volunteer to address kiln drying problems on site. Biva-Les Company of Krasnoyarsk krai has made the same request.

The seminar helped the Forestline' Company (Sakhalin) to identify the dry kiln model it wants to buy. When the company manager saw a locally made dry kiln designed and built by the Khabarovsk 'Promdrev' Company, he realized that that was what he had been looking for. This was very much in line with the seminar recommendation that the Russian wood processors should rely more on nationally made kiln models.

Illustrative Example:

At the request of the Far Eastern Association of NTFP harvesters, Khabarovski Krai society of honey producers and newly established Indigenous Peoples Center for NTFP harvesting and processing, FOREST organized a seminar to teach local honey producers new technologies with the purpose to increase honey production in the region, improve its quality and to be able to compete with honey manufactures from China. Before inviting consultants for the seminar, FOREST identified main topics to be discussed and consultants to be invited.

Winrock International sent two experts who have extensive experience in the U.S. and throughout the world and FOREST invited a Russian scholar from the Russian Beekeeping Academy. Before the seminar the U.S. experts visited one of the local apiaries to learn about problems that Russian beekeepers face and see with their own eyes their technology.

The three-day seminar proved to be very successful. It was a unique event, since there was nothing of the kind in the local history. 25 beekeepers had a chance to learn new approaches and modern technologies of honey production, and to meet together to find answers to problems that could not be solved for many years. The participants were convinced that only by uniting into an association they can solve their problems. The guest speakers at the seminar were not only lecturing, they brought many unique aids and handouts necessary for Russian beekeepers. Great attention was paid to such issues as intensive honey production technologies, hive designs, and bee diseases. As a result the participants were convinced that they should switch to Langstroth bee hives in order to increase their production and be able to compete in the international markets. All the participants were issued graduate certificates by the Russian Beekeeping Academy.

At the end of the seminar Mr. Dementy, who is the chairman of Khabarovsk beekeepers' society extended deep gratitude to the FOREST project for providing them with such a unique opportunity. The seminar received wide coverage by the local mass media. Because of the strong interest in US technologies, when the seminar was over, the U.S. volunteers spent more time visiting apiaries providing extensive consultations to local beekeepers.

Illustrative Example:
During the month of February 2005, the Russian Far East (RFE) Association of Non Timber Forest Product (NTFP) Producers and the Khabarovski Krai Bee-Keepers Society jointly organized special courses on advanced bee hive management and wild honey production. The courses were based on training and guidance these organizations received from the USAID-sponsored FOREST Project in the fall of 2004. The educational courses were completed without USAID funding, demonstrating that the FOREST Project's NTFP programs are becoming institutionalized in local Russian organizations throughout the RFE and that the legacy of new knowledge provided by FOREST Project experts continues to benefit the local community.

3. Methods/Approach

The activities under the Non-Timber Forest Products and Secondary Wood Processing Component addressed primarily the utilization of forest resources, with the aim of sustaining their economic value and securing the integrity of the resource base. These objectives support and complement fire prevention and pest monitoring activities aimed at protecting forest ecosystem health.

The Winrock Team built upon, supported, and expanded the business planning and management capacity of non-timber and timber processing firms and associations established under the Regional Environmental Partnership Program. The approach was to conduct a systematic gap analysis to identify prior work in NTFP and wood processing. This allowed us to quantitatively benchmark current production capacity and forecast the broadest spectrum of likely support requirements. We also assessed existing associations and identified partners for the program.

Two Working Groups, one for NTFP and SWP, were established to help identify the priority areas and to guide planning and activities of the component. The working groups were comprised of a blend of industry, government, non-government and academic partners.

Theoretical Approach

a) Identifying the Issues
During the initial implementation phase, FOREST Project staff reviewed studies and analysis already conducted on NTFP sector issues, analyzed some of them initially in Khabarovsk, and built on previous project experience by:

- updating existing databases or directories of NFTP and secondary wood processors of the selected associations;
- identifying markets for products that could be produced in the RFE and Siberia;
- reviewing policy and legislation actions that were underway;
- identifying financial institutions and sources of credit and investment;
- and, identifying constraints facing industry in the processing of forest products.

Constraints Facing Secondary Wood Processors Most wood harvested from the RFE and Siberia was exported without any value-added processing. While there was great potential for job creation, waste reduction, and increasing sales through secondary wood processing, there were several challenges facing producers:

- Disincentives for harvesters to sell wood locally to secondary processors
- Outdated, inefficient machinery
- Lack of access to capital and credit
- Lack of knowledge of markets and product development
- Limited markets for secondary forest species and small diameter timber
- Products that do not meet export quality criteria
- High transportation costs and long haul distances to markets
- Laws that were not well correlated and that did not support private businesses
- Lack of information and access to technology
- Lack of informed advice on taxation, legal issues, registration, customs, transportation, and business planning and budgeting

Constraints Facing NTFP Businesses NTFP users are typically small businesses producing a few niche market products. There were, however, a few larger, more diversified firms. Many NTFP buyers barter equipment and provisions in exchange for products. In addition, NTFP harvest operations do not usually provide many full-time jobs, but rather supplement family incomes through informal sector mechanisms. Most harvesters focus on a single commodity. Organization of harvesting operations could increase the diversity of products collected and increase harvesters' earning potential. Few harvesting operations have been organized into formal associations, although at least one of the larger NTFP firms has developed a strategy to organize the harvesters from which it buys NTFPs. This firm's purpose in organizing the harvesters was to improve quality and efficiency, ensure and expand reliable sources of plant material, and prevent over-harvesting of the resource. Project activities aimed at small-scale, isolated NFTP users could have locally significant impacts, while coordination with market leaders that operate on a larger scale was considered to allow the project to address regional resource problems and overall market forces.

As many NTFP enterprises were marketing products, such as medicinals and food supplements, they had to deal with complicated, time-consuming registration procedures with the federal government. Because these products were promoted as healthy or natural products, they had to do more than increase consumers' awareness through advertising. To attract customers, they often had to first educate consumers about the benefits of their products. This required a fairly sophisticated marketing approach aimed at diverse audiences. Internet-based marketing tools were considered be especially suited to this type of marketing, but few NTFP firms were using this approach. The NTFP associations with which we met were especially interested in increased access to web-based information and marketing systems and training in electronic commerce strategies.

b) Strengthening Associations

The FOREST team met with a wide variety of government and public enterprises, non-government organizations, and industry associations of several types in Khabarovsk, Krasnoyarsk, Vladivostok, and Sakhalin. We deliberately sought out individual members of associations to "ground truth" membership status and satisfaction with current organizational capacity. Based on the initial meetings, there were several challenges facing associations and their client members that harvested and processed forest resources. For various reasons, associations have not emerged as strong organizations in Siberia and the Russia Far East. In some locations, they didn't exist and local governments had not supported them. In cases where associations existed, they were not always able to provide adequate services to their members. The perception of some businesses towards associations also prevented the associations from attracting new members. Some business owners believed that membership in an association would limit rather than enhance their competitiveness.

Each year, the project identified associations with which to work. Association selection was based on criteria developed by the project through which prospective partners had to be reviewed. Criteria included size, number of members, services to members, established bylaws and management systems, and a sound business plan with description of income (fees etc) and expenditures, (as a way to determine financial sustainability). It should be noted that no

organization was excluded from the review process based on the organization's name (i.e. "unions" were not excluded simply because they did not call themselves "associations").

In addition, during the first year, the FOREST Project developed an application process for additional associations to become partners of the project. Requests for applications had been advertised within the project area and two associations were selected during the second and third year respectively. The project encouraged the formation of new associations by providing volunteer technical assistance to companies interested in forming an association, especially in areas were none existed. The FOREST Project also promoted policy actions that would remove disincentives and support formation of associations.

The FOREST Project adhered to the use of participatory approaches through which association members could identify priorities for improving their businesses, such as training, technical expertise, study tours, access to information, and access to financial resources.

Once the associations had been selected, their members were surveyed to obtain input about the businesses, the products, the problems and potential for improvement. This information was fed into the association database (and project database) and provided a more detailed baseline dataset. The identified problems were assessed and then prioritized in terms what were the greatest obstacles to reaching the component results. The FOREST Project provided a variety of types of technical assistance (e.g., seminars, workshops, and one-on-one consulting) to address the problems. This assisted the Component team in meeting the goal of increasing the value of products through post-harvest processing

Practical Approach

All the activities of the component have been divided into three sections: activities to support associations, member companies, and the forest sector. There were several tasks to be accomplished in the first year of the project. The approach for the first few months was to initiate activities in Khabarovsk and institute a model that could be replicated in other areas.

a) Working through Associations
The strategy for Years 1 and 2 were to focus on working with associations, surveying members, and identifying their problems. This was done in conjunction with examining the products and assessing the potential of export. FOREST has worked with and supported five associations (two wood processing and three NTFP associations) and has completed the domestic and international portion of the market studies.

Supporting Associations has been well received and laid the groundwork for long-term changes. The first two years of the project focused on developing association strategic plans, holding annual meetings, collecting data on association members, and providing direct support as requested. For example, in Year 2 training in advocacy was conducted. In Year 3 FOREST continued supporting existing associations and chose one new partner association, focusing on membership support and financial sustainability. With associations that have been partners for one or two years already, the activities focused on making the associations self-sustaining, and

increasing their ability to provide services to their members (business services, policy advocacy, etc.).

Where appropriate, FOREST drew upon experts from existing association partners to support the new associations. During Years 4 and 5 the focus was on strengthening associations so that they could replace the role FOREST had taken and carry on the FOREST legacy.

The FOREST Project primarily supported existing associations rather than worked to create new associations. The rationale for this approach was that project resources had to be invested in associations that were organized to serve clients needs rather than in those that were created in response to the availability of project funds. Associations that were chosen as partners met some basic criteria, such as a clear mission, a demand-driven approach to providing client services, and a commitment to sustainable resource management and utilization.

Two associations were selected for involvement in Year 1 activities. These associations worked with the FOREST Project team as partners to develop and test models for Non-Timber Forest Products and Secondary Wood Processing association strengthening. In subsequent implementation stages, the FOREST Project expanded its partner base to include associations in other territories. Although the emphasis was on working with existing associations, the Project was ready to support the organization of new associations where there was a clear demand by prospective members and potential for the association to become self-sustaining. Additional partners to implement some of the component activities included local government administrations, training centers, institutions for technology development and testing, research institutes, enterprise development centers, and donor projects with related activities, such as the World Bank funded Sustainable Forestry Pilot Project. The FOREST Project worked closely with the organizers of the World Bank funded Sustainable Forestry Pilot Project to coordinate activities related to this Component. The FOREST Project Manager and Component Coordinator met regularly with the Sustainable Forestry Pilot Project coordinators to determine how the component could enhance implementation of activities funded through the World Bank loan.

Associations convened and communicated with members to stimulate participation in determining priority need and activities. They developed and implemented short, medium, and long-term strategic plans to become self-sufficient, sustainable organizations. They were responsible for monitoring and reporting the impact of the project. The associations also hosted study tours from other territories and helped to strengthen fledgling associations. Other partners, such as local government administrations, training centers, institutions for technology development and testing, research institutes, enterprise development centers, and donor projects with related activities, coordinated with the FOREST Project to support specific activities, such as provision of training or training materials, advice on policy issues, host information resource centers, or introduction of new technologies.

b) Strengthening Businesses

The forest sector had all the potential to boost the economic development of Siberia and the Russia Far East. FOREST has focused on supporting the sector by 1) assisting companies per

their request and 2) systematically identifying companies with the greatest potential of adding value to their products (by retooling or adding equipment). The approach has been to:

- Assess members (what they produce, what their problems are, etc) and compiling information in a database.
- Conduct market studies. The initial market study conducted by local consultants summarized the current products/species used (throughout all five oblasts/krais where FOREST works). International consultants assessed the current and potential capacity and identified key products that have the potential for export.

The primary focus was to provide effective technical and business support services to companies - via the associations and directly, and through both training workshops and individual consultations. Through technical assistance, training, and collaboration with other programs, FOREST increased businesses' efficiency, waste reduction, product quality, export contacts, ability to write business plans and access to financing (loans and non-bank financial institutions). FOREST built on the successful activities from Years 1 and 2 such as sending delegations to international trade shows and conducting hands-on training in practical areas such as saw filing.

c) Supporting the Sector as a Whole

FOREST also continued to support development of the forest products industry overall in the region, through market studies and sector-based workshops bringing together private businesses, government, and finance institutions to look at working together to reach the potential of the forest sector.

With a clear understanding of the regions' production quality, quantity, and potential, the second phase of the market studies identified key markets for value-added products. Based on the initial findings, FOREST could best support **secondary wood processing** by focusing on:

1. improving local capacity in managing and maintaining equipment – especially saws;
2. working with exporters of raw logs to either cut and dry their own wood or sell it to local processors;
3. developing business plans for companies and helping them secure financing;
4. exploring new product production by developing feasibility plans;
5. supporting key companies willing to retool or increase value-added processing based on the findings for exports based on international market demand;
6. linking companies with potential to interested buyers of Russian wood products;
7. targeting key companies with the capacity to export products to target countries by attending and displaying products at international trade shows; and
8. improving companies' basic management skills.

Based on the initial findings, FOREST could best support **non-timber forest product processing** by focusing on:

1. reviewing local market studies to understand key products of the area;
2. completing the international market study by identifying the top five (both volume and economic value) NTF products per region that have the potential for greater marketing;

3. identifying key markets for the top products (identify any US/Europe markets and if the value-added processing for Asia bound products could be done in Russia);
4. strengthening the value-added processing of the key products – in many cases it could be as simple as grading the products locally;
5. ensuring production quality and quantity for export or domestic markets, which required formation of cooperatives to give producers strengths in numbers; and
6. exploring new ways to process or package key products such as pine nuts, mushrooms, and ferns which could be sold both domestically and internationally.

Since the beginning, FOREST has been adaptively managed. Consecutive workplans were built on the previous years' experience. Each year the project has become increasingly focused to achieve results. The first three years focused on implementing projects in Siberia and the Russian Far East. Year 1 activities were targeted in specific krais or oblasts, in essence to test an approach. During Years 2 and 3 each component replicated its successes to other areas. Through the process, the project staff has been refined and improved activities which have yielded sound results. Working with associations and businesses, FOREST has helped identify markets for processed forest goods.

It became apparent that if FOREST continued expanding to each of the five project areas, there would be little sustainability of the activities. USAID and the FOREST partners met and decided to change the approach of the project to shift the emphasis to sustainability. The purpose was to leave a legacy that would be institutionalized by our Russian partners at the end of the five years.

The Year 4 workplan reflected this new direction. The differences included focusing on building up the capacity of the associations to carry on the work FOREST had initiated, including facilitating companies to work together, sharing and disseminating information, advocating, and hosting industry based meetings. By the end of the project, associations will replace the role FOREST has taken in the past few years to carry on the FOREST legacy.

In summary, the project supported the following tasks under the component:

Support to Associations

- Identify and profile all current NTFP producers and wood processors, paying particular attention to strengths and limiting weaknesses. Analyze selected producer associations' operations, products, and markets.
- Identify associations to work with (Years 1-3)
- Conduct study to establish baseline data. (Year 1)
- Establish a database describing all NTFP and wood processing activities and analyzing product potential, institutional and business constraints, and other factors limiting expansion, update directories and databases, and create websites for partner associations. (Years 1-3)
- Facilitation of annual association meetings, development of strategic plans for the associations. (Years 1-3)
- Assist associations in developing marketing strategies, networking with international companies interested in Russian products, accessing international "buyers groups," and participating in international trade fairs improve associations' ability to represent and

market themselves to global firms, grant making institutions, etc.;
- Engage in direct capacity building within the Associations, including services identification and development for sustainability, Training of Trainers for specific technical skills (such as kiln drying, contract negotiation, Information Resources) by Association representatives enabling them to offer fee-based training to members;
- Increase capacity of the Association leaders and members to a) track, monitor and coordinate participation in international trade shows, linkage missions, and other activities to promote trade and technology transfer, and b) communicate with international donors, governments and private companies;
- Facilitate regional association collaboration development;
- Facilitate reverse trade missions

Support Businesses
- Provide training, consultancy and technical assistance for association members aimed at business development such as new products development, introduction of new technologies, product promotion
- Participate in international trade shows, coordinate cost sharing for Trade Missions; begin to prepare member companies to fund these activities through their sales revenue;
- Conduct Study Tour for association members to USA;
- Further increase sales, jobs and markets through value added processing of non-timber forest products and wood processing. Increase secondary wood processing for high value products by linking buyers to markets, providing technical assistance in meeting market standards and assist in business skills.
- Assist in certification process of NTFP products.

Support Sector as a Whole
- Market Information Studies.
- In cooperation with local governments facilitate the development of legal procedures aimed at sustainable forest use (Year 4)
- Assistance to indigenous communities
- Provide sector based workshops and training.
- Establish Information Resource Centers.
- Facilitate NTFP regulation development (Year 4)

4. Activities and Significance to USAID

Through the work of this component, FOREST improved effective use of forest resources, increased production of processed forest products supporting USAID/Russia strategic objective SO 1.6 Environmental Resources Managed More Efficiently to Support Economic Growth, while work to strengthen associations promoted SO 2.1 More Open, Participatory Societies. For a detailed description of activities see **2. Summary of Results and Impact** above.

5. Legacy

During the final years of the project, the component's goal was to secure a legacy – to leave behind stronger institutions, organizations and companies that would continue to work with associations and companies in increasing the value added processing started by FOREST.

FOREST left its impact in three areas in compliance with its goals and objectives**.**

- Associations support
- Businesses support
- Industry support

Associations

FOREST left 6 professional associations, 3 of which were created with FOREST support. New associations appeared in Sakhalin and Siberia and they proved to play an active role in the industry development in these regions. All partner associations increased their capabilities and became more sustainable and are recognized by government officials - their image and prestige have grown considerably. All of them are involved in the development of the forest industry in their respective areas and the local governments often use them as key implementers. One association has grown beyond the boundaries of one region and has become an interregional association uniting companies from six regions. The associations have been able to expand the range of the paid services they provide to their members and thus become more sustainable financially.

Businesses

- Four new businesses were created with the focus on NTFP and wood processing
- 25 up-to-date technologies introduced and production lines installed
- Equipment worth $ 4. 7 million purchased
- 74 new kinds of products developed
- 761 people trained

Illustrative Example:

Four wood processing companies from Khabarovski and Primorski krais which are FOREST Project partners participated at "Surfaces 2005" trade show in Las Vegas, January 29-31. Previously it was the FOREST Project which identified the shows, made travel arrangements and paid for participation with the purpose of putting this activity into practice so that the companies can take it upon themselves when FOREST closes. This trip was very different because FOREST provided only visa support to the companies. Everything was arranged by the companies themselves and they covered 100% of all expenses. This testifies to the fact that FOREST has achieved one of its goals. As a result of participation Dynasty, a company that has received extensive support from FOREST, succeeded in promoting their products. Inspired by the success of the show, companies are considering the possibility of participating in AWFS ® Vegas trade show (The Association of Woodworking and Furnishing Suppliers).

Industry

- New legislation developed
- Markets identified and studied
- Two resource information centers established

6. Lessons Learned and Recommendations

High competitiveness within forest industry presented some problems since once in a while partner companies did not want to cooperate within the associations and did not confide in each

other. The same can be said about U.S. associations. Due to the highly competitive nature of the secondary wood processing sector in the United States, associations have demonstrated limited interest in teaming with Russian partners whom they see as potential competitors.

One of the primary challenges for Russian companies was the language barrier (virtually all Russian business people do not speak English). As a result, Winrock/FOREST staff handled virtually all the contact with the public. Delegations should strive to involve businesses who provide English speaking sales staff and have sufficient capacity and/or willingness to learn.

IT technology has not yet become an intrinsic feature of our partners' activity. Internet resources were not utilized or minimally utilized by the businesses in the Far East and Siberia.

Another discouraging factor was high migration rate within the NTFP sector which can be accounted for by low wages. A number of people that we trained at numerous seminars and workshops have left the industry in pursuit of higher wages, sometimes leaving the region as well for opportunities in Western Russia.

During project implementation we discovered some very effective activities. The reverse trade tour of foreign businesses to Russia was exceptional with minimal cost to FOREST because the participants covered 100% of their expenses. This proved to be extremely successful resulting in a $1 million USD contract, with more contracts and investment projects pending.

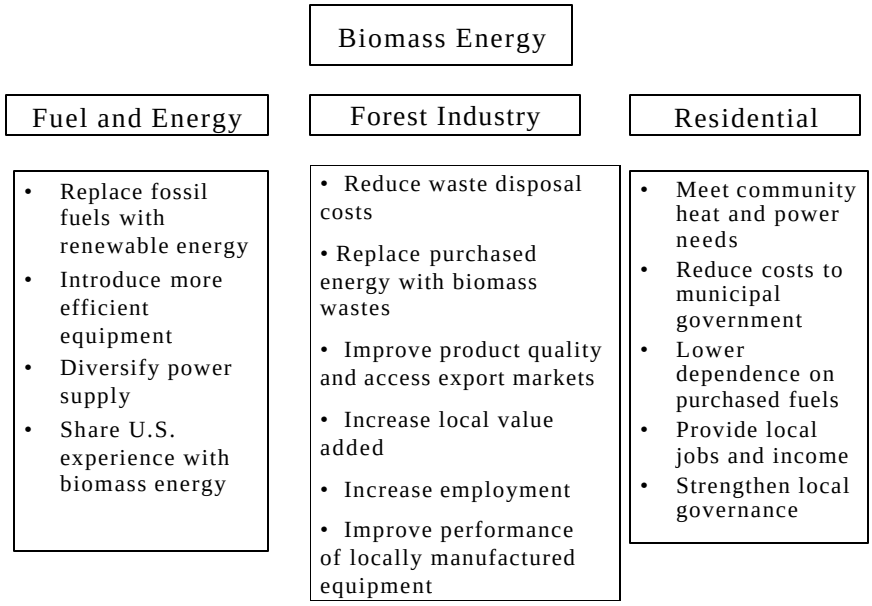
D. Component 4 - Renewable Energy Alternatives/Biomass

1. Introduction and Component Goal

Forests are one of Russia's most important natural resources and especially important to the economy of Siberia and the Russian Far East. Since 2000, the FOREST Project's biomass energy activities have supported national objectives to strengthen the forest products industry and the economy of Russia. Overall, experience with biomass energy systems in Russia is limited. During the Soviet period, the central government subsidized the supply of fossil fuels, providing little incentive for the industry to use biomass residues as a source of fuel. Today, the restructuring of the United Energy Systems of Russia and the difficulty in forecasting energy tariffs has created an unstable energy environment. The costs of energy, fossil fuel, and transportation all continue to rise. As the private sector, particularly small and medium-sized businesses, continues to grow, an increasing number of Russian forest product companies are seeking ways to cut costs and add value to raw logs.

Currently, the primary export product from Siberia and the Russian Far East is raw logs. Increasing value-added processing in Russia will produce major financial and economic benefits for the region. The primary barriers to greater value-added processing in the region are the availability and high cost of energy and the limited and expensive transportation infrastructure. The FOREST Project has demonstrated, however, that utilization of sawdust and wood-processing by-products, commonly viewed as a waste disposal problem, can help companies produce higher value products by fueling dry kilns, as well as reduce waste management costs, provide reliable energy supplies, and reduce the cost of processing facilities. Such wastes can

also be used to meet heat and power needs of remote settlements where the cost of supplying coal and diesel fuel are several times higher than the cost of biomass energy. With effective management, the forest products industry should also be the largest employer in the region. The following diagram illustrates how biomass energy impacts three sectors of the Russian economy – the fuel and energy industry, the forest industry, and the residential sector.



Throughout the five years of the Russia FOREST Project, the Biomass Energy Team worked closely with the forest products industry in Siberia and the Russian Far East, and with manufacturers of equipment, to demonstrate the economic benefits of biomass energy, increase understanding of biomass energy systems, and improve designs and performance of Russian manufacturers. For many companies, investing in biomass energy systems fueled with wood wastes makes compelling economic sense. Companies save by utilizing biomass wastes for which they currently pay a disposal cost, and by replacing purchased fuel and electricity with self-generation. Companies also earn profits by utilizing biomass systems to produce wood products with greater value for local and international markets. As the benefits of biomass energy activities became more widely recognized, FOREST received increasing numbers of requests from companies in search of assistance to develop biomass energy systems capable of burning wood wastes.

2. Summary of Results and Impact

FOREST's main priority was to work closely with partner companies to ensure that at least 50 MW (thermal capacity) woodwaste-fueled biomass systems would be either under construction or completed by the end of the FOREST Project. In addition, at least one biomass facility would be commercially tested and in full operation by the end of the Project and available to demonstrate the viability of biomass systems in the region. FOREST also aimed to increase Russian expertise such that similar biomass energy projects could be replicated in the future once the Project ended.

While the Biomass Energy Component of the FOREST Project exceeded its stated performance targets, the impact of the project extends far beyond the chosen indicators. When project activities started, there was suspicion of U.S. motives and reluctance to cooperate. Project staff and U.S. experts worked collaboratively with Russian experts and companies to understand existing technical and manufacturing capabilities and to integrate U.S. design approaches and experience in ways that addressed Russian concerns. As a result, the FOREST Project demonstrated and transferred the U.S. approach to technical design and encouraged collaboration among Russian companies to strengthen the overall sector. The approach produced good will and trust within the sector that will continue and could provide an excellent base from which to pursue additional development objectives in the region.

The following indicators and sub-indicators were used to measure the results and impacts of the FOREST biomass energy activities:

Indicators:

- Increase in megawatts of biomass power (targeted total biomass capacity 50 MW thermal),
- Increase in number of biomass units (including dry kiln and biomass boiler systems) installed and under construction.

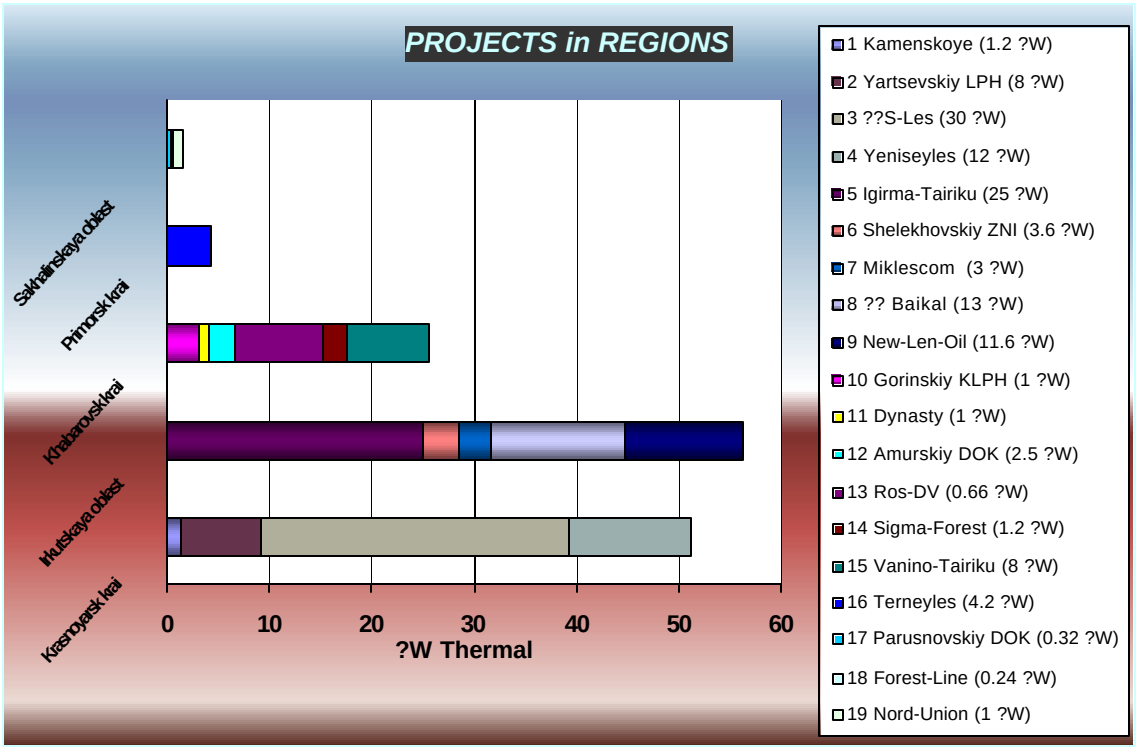
Sub-indicators:

- Increase in leveraged investment into biomass facility,
- Increase in companies' profit (expert estimation),
- Increase in capacity in biomass engineering, operation, manufacturing and other activity (trained specialists and experts).

Biomass Component Indicators and Sub-indicators by Year

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Megawatts (MW)	0	1	17.5	34.5	76.5	76.5 MW
Boilers Dry kilns	0 0	1 3	6 7	18 41	25 63	88 units
Leveraged investment ($USA)	0	1,000.000	2,600.000	6,300.000	11,800.000	11,800,000
Companies' profit ($ USA/year)	0	300,000	5,600.000	6,900.000	12,900.000	14,600,000
Trained specialists and experts	44	171	529	732	750	750

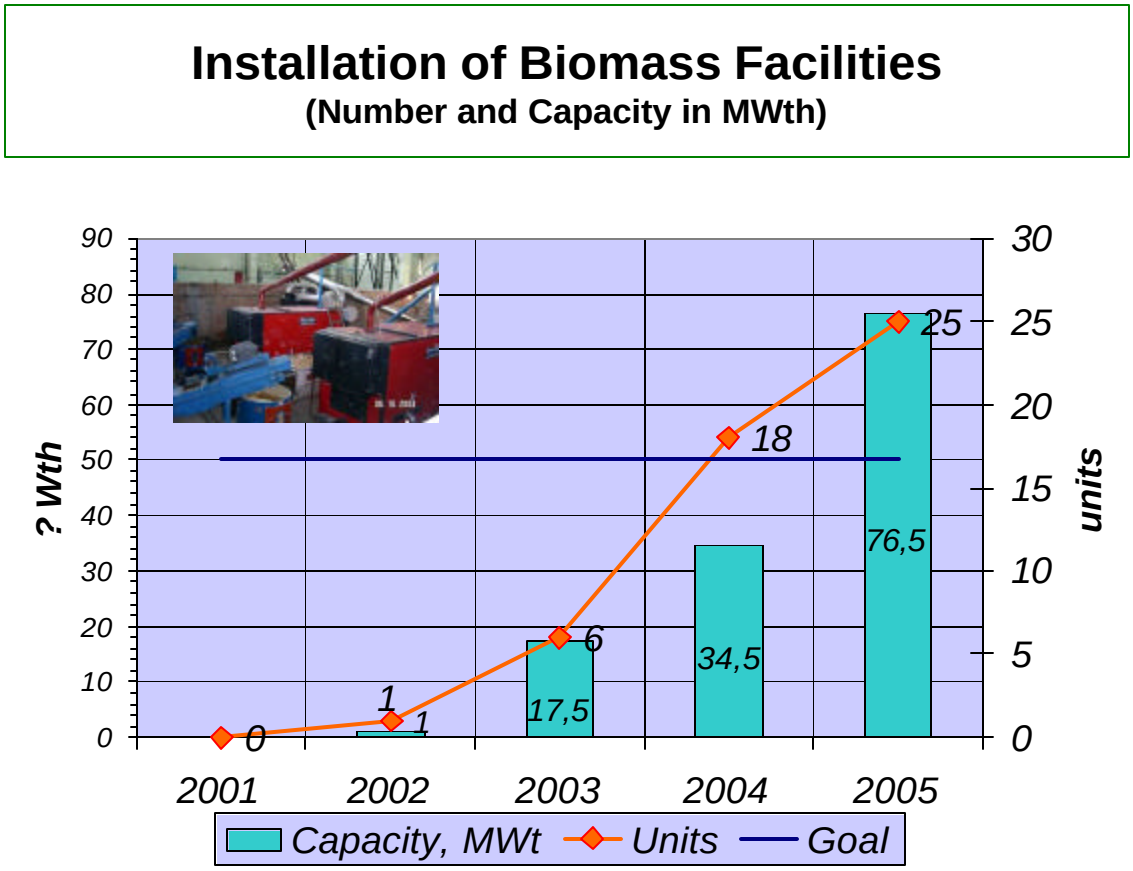
The FOREST Project provided technical and/or financial support to a total of 19 forest product industries of various sizes in Siberia and the Russian Far East. The following diagram illustrates FOREST Project partner companies by geographical region.



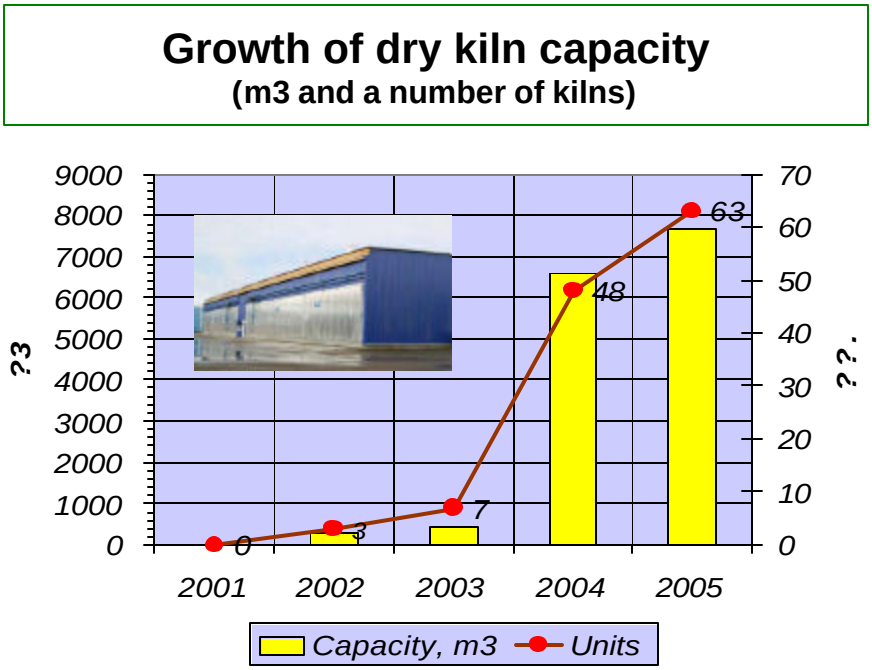
FOREST Project assisted each of its FOREST Project partner companies in the design, construction, and testing of biomass systems. By the end of the FOREST Project in July 2005, the total amount of MWth under construction or completed will have exceeded the target indicator of 50 MWth by 12.5 MWth.

Success Story:

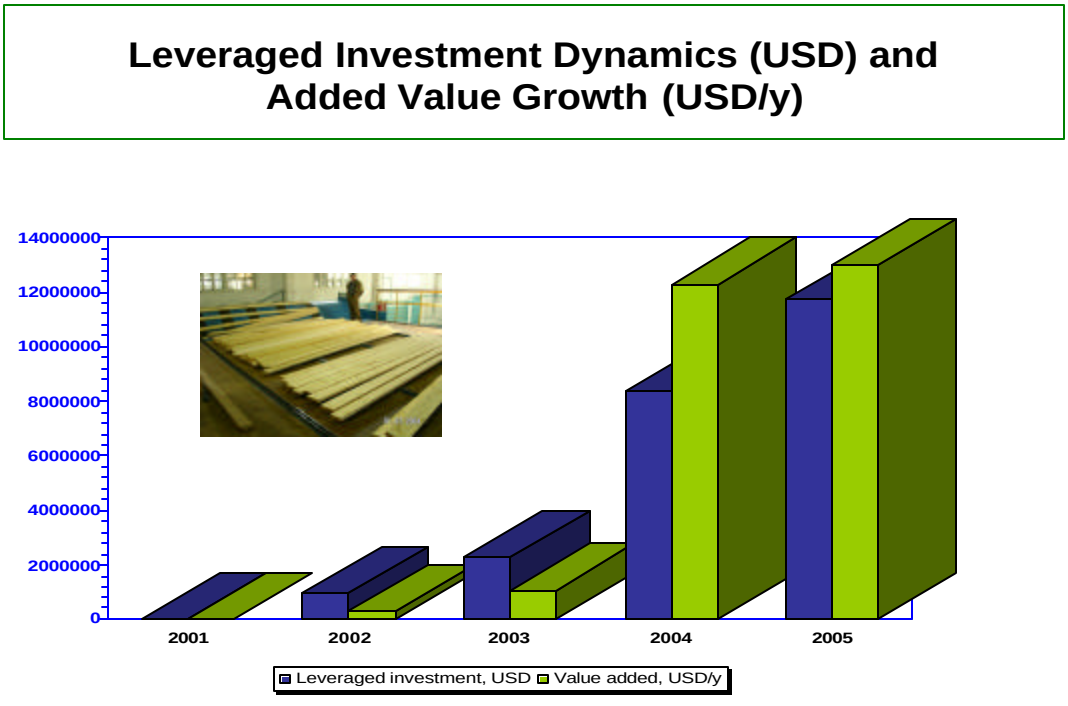
Igirma-Tairiku, a long-standing FOREST partner, has three Biysk boilers (19.5 MW thermal energy) in full operation. The third boiler was successfully installed in December 2004. The FOREST Project worked with Igirma-Tairiku engineers to analyze performance issues with existing boilers and used the design review process to facilitate a revised boiler design from Russian manufacturer Biysk. FOREST biomass energy experts then worked alongside Igirma-Tairiku to perform acceptance tests on the first two boilers and demonstrate procedures for effectively operating and maintaining the company's three boilers. The biomass boiler system has enabled Igirma-Tairiku to put into operation 16 dry kilns (4 Muhlbuck-Vanicek and 12 Tekmawood) and increase dry lumber output to over 150,000 m3 per year with an estimated profit of over 5.0 million USD per year. Roughly 67% of heat output is also used to supply heat to the Novaya Igirma settlement. These modified boilers are the first major biomass energy facility in Russia able to burn wet bark that formerly had to be buried as Russian equipment capable of burning wet bark did not exist. This biomass energy facility serves as a model for other companies in the region interested in installing similar biomass energy facilities.



Boilers and dry kilns are typically constructed simultaneously. FOREST partner companies installed new or improved boiler and dry kiln capacities to meet wood quality specifications for the international market. The addition of drying capacity fueled with biomass wastes proved to be the greatest opportunity for adding value to forest products in the near term.



Since 2002, FOREST partner companies invested $11,800,000 in biomass energy facilities, with a return on earnings of approximately $14,600,000.



Success Story:
The Dynasty Company (Khabarovsk) represents a long-term FOREST partner with the innovative management and initiative to take full advantage of USAID technical assistance. Having worked with two FOREST volunteers in February 2002 - to develop a market study and business plan for a new edge-glued panels production line - Dynasty received a $495,000 loan combined with finance from Weinig, the German equipment supplier. Within a year, through continuing FOREST Project assistance, Dynasty installed a sawmill (Strojcad), a 100 m^3 dry kiln complex (Katres), and a 1 MW biomass boiler (Kirov Boiler Plant), with the Weinig edge-laminating/finger-jointing line. The boiler project was successfully launched under biomass energy expert guidance. The boiler personnel received training on biomass boiler operation and maintenance. The boiler and dry kiln complex is operational – enabling the company to serve as a model for participants in FOREST's (in cooperation with the Ministry of Timber Industry) kiln and boiler training seminar in March 2003. Seminar participants visited Dynasty and other companies to learn about operational issues and technology options (Russian and foreign). The new facility enables Dynasty to utilize wood wastes to fire the boiler, heating the kilns to dry about 5,000 m^3 of lumber per year – which amounts to $ 130,000 of added value per year, about $10,000-20,000 per year in avoided landfill costs, and reduced bills for purchased energy.

The FOREST Project used the development and operation of new biomass energy facilities to increase the capacity of specialists in the region, particularly with regard to the engineering, operation, and manufacturing of biomass facilities. Russian experts were hired in partnership with local companies to initiate design efforts on specific projects. The results of their work were integrated with U.S. design expertise in a design review process where all participants could learn from each other. U.S. experts gained insights into the challenges of operating equipment in severe Russian conditions while Russian experts learned about U.S. operating experience and how different biomass energy technologies evolved.

The knowledge and improved understanding that resulted was captured in training seminars and fact sheets. From 2000-2005, the biomass team conducted a total of 73 training events in the form of site visits, focused technical assistance, design review sessions, assistance on bid documents and equipment procurement, performance of acceptance tests, and study tours (both regional and international). About 750 specialists, specifically designers, boiler and dry kiln operators, steam engineers, managers, biomass facility manufacturers, and university and research and development specialists took part in the trainings. The process of working with these partner companies developed a core base of Russian experience in the region.

3. Methods/Approach

The Biomass Team promoted biomass energy use in five FOREST target regions by:

- Assisting in the design, construction and operation of biomass facilities,
- Raising expertise in biomass energy in the region,
- Catalyzing investments in biomass facilities,
- Establishing partnership between Russian manufacturers and forestry companies
- Civil society strengthening
- Information dissemination

Assisting in the design, construction and operation of biomass facilities

Throughout the FOREST Project, the Biomass Energy Team guided its active partner companies in the design, construction, and testing of biomass systems. FOREST Russian and foreign consultants specializing in the engineering and construction of biomass-fired small-scale cogeneration plants provided focused technical and financial assistance in the form of technical evaluations and design recommendations to advance specific projects. FOREST biomass energy experts assisted partners in many aspects, such as understanding how to: Burn bark and other problem residues; improve air management in biomass boilers to improve performance and efficiency; address wrong bed materials in fluidized beds; determine pump sizing for boiler feedwater; minimize water quality concerns; and provided current data on the status of commercial experience with gasifiers. FOREST consultants and volunteers, both Russian and international, also helped partner companies prepare bid packages to negotiate better prices from Russian and international equipment suppliers. During the construction and commissioning of the biomass energy systems, FOREST Russian and foreign experts also assisted partner

companies in conducting acceptance tests and in the preparation of operation and maintenance procedures.

Raising expertise in biomass energy in the region

The Biomass Team also conducted design review sessions for partner companies. Currently, there are few biomass energy facilities in Russia. Bringing together technical specialists to identify key issues and prepare technical reviews for each facility benefited all participants, raised expertise in the region, and reduced the risk of project failure. The design review sessions brought Russian consultants; design firms; company technical personnel; potential equipment suppliers; and foreign experts together to address how to overcome specific technical design problems in installing biomass projects. During the design review sessions, FOREST international biomass experts shared U.S. experience with design features using biomass fuels to achieve improved performance, increased reliability, and simplified operation and maintenance. These sessions were instrumental in moving biomass energy projects forward and in expanding the skills of Russian specialists in the region through cooperation and collaboration among companies.

Local FOREST partner institutions with increased capacity to design and construct biomass energy facilities:

#	Company, Organization	Comments
	Krasnoyarski Krai	
1.	Krasnoyarsk Institute for Technical Physics	Developed investment studies for a biomass CHP for Yartsevskiy LPH and TTS-Les and a biomass boiler and dry kiln system for Kamenskoye
2.	Siberian State Technological University	Participated in wood drying activity
	Irkutskaya Oblast	
3.	Irkutsk Research Institute of Timber Industry (IrkutskNIILP)	Developed investment study for biomass boiler and dry kiln systems for Shelekhovskiy ZBI and Miklescom
4.	Energy Systems Institute Siberian Branch of Russian Academy of Siences	Developed investment studies and technical assistance for Dynasty, Amuskiy DOK, Gorinskiy KLPH at the start up and commissioning stage
5.	Sibgiprobum	Developed investment studies for Yeniseyles
6.	Bratskenergoproect	Developed design for Irirma-Tairiku boiler plant
7.	Vostokenergomontage	Constructed TM Baikal boiler plant
8.	Irkutskgiprolestrans	Developed investment study of biomass boiler &dry kiln system for New-Len-Oil
9.	Irkutskenergonadzor	Arranged biomass boiler design meetings
	Khabarovski Krai	
10.	Dallespromproect	Developed feasibility study for De-Kastryles
11.	Khabarovsk State Technological University	Participated in wood drying activity
12.	INCO	Participated in wood drying activity
13.	DalNIILH	Participated in biomass energy potential assessment
	Primorye	
14.	Turboblock-Service	Developed investment study of biomass CHP for Terneyles

Biysk		
15.	Biysk Boiler Plant	Modified and manufactured boilers for Igirma-Tairiku and TM Baikal
16.	Research Center Biyskenergomash	Participated in boiler design activity
Kaluga		
17.	Kaluga Turbine Works	Developed a feasibility study of biomass CHP for Igirma-Tairiku
18.	Energoresurs-SP	Participated in biomass CHP discussions
Kovrov		
19.	Kovrov Boiler Plant	Manufactured a boiler for Amurskiy DOK
Moscow		
20.	State Scientific Center of Timber Industry	Developed investment study for a gasifier and dry kiln system for Parusnovskiy DOK

FOREST also conducted both regional and international study tours. For instance, partner companies visited Igirma-Tairiku (Irkutskaya Oblast), who received FOREST assistance to modify its two boilers, the first of its kind in the region to be able to efficiently burn bark. These modified boilers served as a model for other companies in the region interested in installing similar biomass energy facilities.

FOREST also conducted a two-week study tour to the U.S. in April 2004 for more focused review of the technical status of biomass energy systems within the forest products industry of the United States. In general, the U.S. has a rich experience with the development and use of biomass energy systems in the forest products industry that is considered today to be one of the most sophisticated worldwide. Eight partner companies from Siberia and the Russian Far East visited sawmills, sawmills with boilers, dry kilns, steam engines, steam turbines, wood fuel pellet manufacturing systems, stand alone biomass power plants, and equipment manufacturers and suppliers in Washington, Oregon, and California. Site visits focused on how various operation and maintenance problems have been addressed in the U.S., including storage and handling of difficult fuels and how equipment specifications affect technical and financial performance results. A dry kiln seminar at Oregon State University provided valuable information on the production of high-value appearance grade lumber to export standards and approaches, including equipment modifications and improved operations, to prevent such defects as checks and splits; stress; moisture content (variability); and colors, stains, and pitch. Another training seminar addressed appropriate fuel processing, feed systems, and grate hardware suitable for specific biomass fuel(s) in the design and operation of McBurney boilers and turbines. The U.S. study tour increased expertise among Russian key equipment suppliers of boilers and turbines, partner companies, and design firms in operating biomass energy facilities in the region, and fundamentally changed the decision-making framework companies used in making investment decisions. The study tour also strengthened commercial partnerships between U.S. companies interested in importing higher quality added value forest products.

Given that the greatest opportunity for adding value to forest products in the near term is through the addition of drying capacity fueled with biomass wastes, the Biomass Energy Team also cooperated with the Secondary-Wood Processing Team of the FOREST Project in the integration of biomass energy systems with dry kilns in a *reverse trade mission* in Russia. This tour brought U.S. and Russian forest products companies and manufacturers together for site visits and

technical trainings on the use of dry kilns. The mission also fostered business and trust relationships between leading Russian companies interested in becoming solid business partners for U.S. interests.

Catalyzing investments in biomass facilities

While many large forest product companies in the region are able to arrange their own financing for investments in biomass energy systems, smaller companies frequently rely on local banks or government for financing. One of the greatest challenges faced by small Russian companies seeking to produce forest products is access to investment capital. From the beginning, the FOREST Project included bank representatives in design meetings and training seminars so they could become familiar with costs and revenues associated with investments in the forest products industry including the critical importance of managing energy costs to achieve overall financial performance. They learned what risks to expect and how to manage risk. The FOREST Project worked alongside local banks and Russian consultants to improve their ability to conduct due diligence of small companies planning to install dry kilns with biomass energy systems. The biomass energy systems now operating will increase investor confidence. Unfortunately, the project ended before local financial models could be developed and tested. Further work could potentially leverage substantial private investment in the sector.

Establishing partnership between Russian and U.S. manufacturers and forestry companies

Russian manufacturers have a significant price advantage compared to foreign manufacturers. Introduction of successful biomass energy systems could be accelerated if ways could be found to combine U.S. design and operating experience with Russian manufacturing costs. FOREST sought to identify and introduce new approaches for improving and modifying the sale and service of Russian biomass energy equipment. The Biomass Energy Team established a targeted financial assistance program to encourage Russian manufacturers and FOREST Project companies in the Russian Far East and Siberia to partner to develop biomass energy systems. Because of the trust developed by the FOREST Project, significant opportunity exists for expanded use of these mechanisms to stimulate innovation and collaboration. For instance, FOREST provided assistance to Russian partner companies in developing bid packages to negotiate equipment prices with Russian or international suppliers in potential commercial partnerships.

The Biomass Energy Team also made an effort to identify foreign companies interested in buying Russian wood products. Many U.S. companies had bad commercial experience in Russia in the 1990's. FOREST's biomass experts identified various U.S. biomass energy companies with good track records and experience. With the trust the Biomass Team developed with leading Russian companies, solid business partnerships between these U.S. and Russian companies were made. U.S. companies seeking reliable supplies of high quality wood for use in high-value products, such as doors and windows, and U.S. manufacturers of biomass energy equipment, entered into commercial partnerships with Russian partners to supply equipment for the Russian market.

Civil Society Strengthening

One of the largest municipal expenses in the Russian Far East and Siberia is the cost of meeting heat and power needs of remote communities. The Biomass Energy Team recognized that biomass energy systems could meet heat and power demand of remote communities in forest areas at significantly lower costs than systems based on purchased fossil fuels. However, municipal governments lacked the financial means to invest in such systems. Consequently, the Biomass Team focused initial efforts to develop operating examples with private companies that had the financial means to invest. Since systems began operating in 2004, interest in municipal systems has increased.

The Biomass Team convened a civil society workshop in November 2004 of regional and international government representatives and experts to discuss relevant technical, institutional, economic, social, and political needs of providing heat and power to remote settlements in Siberia and the Russian Far East. Supply of reliable heat and power to remote settlements is a key government function and an important factor in how local people view the effectiveness of local government. The provision of such biomass systems also has the potential to mobilize communities in planning, making decisions, and building partnerships. As a result of the workshop, interest among local and regional governments in the Russian Far East and Siberia increased in identifying and developing plans for pilot projects. Proposed sites are in Sakhalin (Parusnoye and Byuhukly settlements); Primorye (Plastun settlement); Khabarovski Krai (Gorin settlement, Amursk and Sovgavan towns); Irkutskaya Oblast (Novaya Igirma settlement, Svirsk town); and Krasnoyarski Krai (Taseevo settlement).

Due to economies of scale, small biomass energy plants of the size needed by most remote settlements are typically expensive per unit output of power and heat. Locally manufactured 800 kW – 1.2 MW modular biomass cogeneration facilities, or preassembled, integrated boiler-kiln packages for small forest product companies and communities could reduce total costs. Russian timber companies and FOREST Project experts discussed options to reduce costs and simplify operation with Russian equipment manufacturers. Additional funding could stimulate innovative and cost-effective ways to provide heat and power to communities. Because many forest products facilities create sufficient processing residues to produce surplus heat and power, they represent good initial candidates for testing new approaches.

The experience with biomass energy systems developed under the FOREST Project has been used to leverage additional international interest in the creation of mechanisms to help finance community heat and power plants. European funders and the World Bank are working with Winrock International to introduce new financial mechanisms based on potential revenues from the sale of reductions in greenhouse gas emissions that will result from conversion of district heating plants in Khabarovsk and Irkutsk from fossil fuels to biomass fuels.

Information Dissemination

The Biomass Team prepared fact sheets and case studies to document the financial and economic benefits of biomass energy projects implemented under the FOREST Project for dissemination. In general, there is a shortage of technical publications available in the RFE and Siberia on the

utilization of biomass wood wastes to generate heat and power. Data on revenues, jobs, and economic benefits from investment was also collected and discussed with potential partner companies. This data was incorporated into the Component's economic models, taking into consideration sensitivity analyses and risk management.

FOREST increased awareness in the region of biomass energy activities through the internet, mass media, publications, members of the Working Group and the Advisory Council. The Biomass Team also actively took part in conferences, such as the "Renewable Energy 2003: State, Problems, and Prospects" in St. Petersburg in Nov 2003, on non-conventional and renewable energy resources, energy savings, and other issues related to biomass energy use in Russia. The approach to information dissemination and other outreach continued to generate requests from companies in the region for partnerships.

Ultimately, FOREST successfully transferred expertise with biomass energy systems to Russian consultants, design firms, company technical personnel, potential equipment suppliers, and local banks such that Russian companies will continue to install successful biomass energy systems in the forest products industry in the future.

4. Activities and Significance to USAID

USAID SO 1.6 Environmental Resource Managed More Efficiently to Support Economic Growth IR 1.6.2. Operating efficiency of businesses adopting environmentally friendly practices improved.

- Businesses showing improved environmental practices
- Amount of economic benefit received by local businesses as a result of introducing new biomass energy plant
- Number of local institutions, with increased capacity to design and construct biomass energy facilities
- Number of people, who received training in biomass energy use through biomass energy workshops, design review meetings, study tours, seminars (male/female/total)

5. Legacy

The legacy of the Biomass Energy Component is:

- **Energy**
  - 50+ MWth of energy facilities
  - 150,000 tons/year of substituted coal and 9 million in USD/year of saving
  - 200,000 tons/year of utilized wood wastes
  - 7000 m^3 of operating dry kilns
- **Investment and income**
  - 12 million USD/year of investments
  - 13 million USD/year of added value of products
  - 450,000 m^3/year of dry lumber
- **Capacity Building**
  - 732 trained specialists from companies, design firms, and educational institutions

The FOREST Biomass Energy Team focused on decreasing the cost of energy and increasing the reliability of supply to the forest products industry through:

- Utilizing biomass wastes for which companies currently pay a disposal cost,
- Replacing purchased fuel and electricity with self-generation, and
- Earning profits from producing higher quality wood products that are more competitive in the international market.

Ultimately, the legacy the biomass FOREST Project will have on the region is in raising expertise such that similar biomass energy projects can be replicated in the future once the FOREST Project ends. FOREST biomass energy experts developed sound relationships with a number of Russian partner companies, their design firms, and Russian manufacturers of boilers and turbines to identify opportunities for improving the effectiveness and efficiency of biomass-fueled facilities, and guided them through the design, construction and testing process over throughout the FOREST Project. More importantly, in the process of working with individual companies, the Biomass Team developed a core base of Russian experience and created working examples that serve as models for other companies in the region. The FOREST Project raised the understanding and awareness across the industry in a way that built on existing Russian expertise and added American expertise where it brought most value.

Success Story:
FOREST partner company, TM-Baikal, is constructing two modified Byisk boilers (6.5 MW each) based on Igirma-Tairiku's experience. They attended the regional study tour at Igirma-Tairiku. This boiler-dry kiln biomass facility will enable TM Baikal to increase the percentage of lumber it drys from 7% to 80%, producing 115,000 m^3 of dry lumber per year. The company expects to earn an additional $2.9 million USD per year from the sale of dry lumber.

A second legacy of the Biomass Energy Component of the FOREST Project is the strengthening of business relationships between the forest products companies and manufacturers in Russia and the United States. The FOREST Project developed trust relationships with leading Russian companies who could become solid business partners for U.S. interests.

Finally, successful use of biomass energy in the forest products sector could lead to broader use of biomass energy to meet local needs for heat and power. Currently, many remote communities have become non-viable economically because of the high cost of fossil fuel. Locally manufactured biomass energy systems could bring down the cost and improve the reliability of energy for these communities.

USAID FOREST Project Potential Being Tapped Further Prior to Closure
On March 29, 2005, FOREST Biomass Specialist Tatyana Khodos met with the Minister of Industry and Timber of Khabarovski Krai, Mr. Vasily Shikhalyov, to discuss expanding work completed under USAID's FOREST Project. Minister Shikhalyov stressed his desire to institutionalize and replicate models of biomass facilities successfully put into operation under the FOREST Project in Irkutskaya Oblast in Khabarovski Krai. Funding for such biomass facilities may be possible as the Ministry plans to support six new forest-related projects in Krasnoyrask (in Sovgavan, Sukpai, Yagodny, De-Kastry, Berezovy, and Myhen). USAID's

FOREST Project has clearly demonstrated the potential of utilizing wood residues in biomass facilities in a sustainable manner, thereby improving the economy and environment of the region.

FOREST Project Continues Institutionalization of Biomass Energy Use in Irkutskaya Oblast
FOREST is assisting Irkutskaya Oblast communities in submitting applications for ROLL Project grants. Activities geared towards saving energy in Irkutskaya Oblast are being given high priority in this round of grants. Having already assisted in the development of more than 50 MWth biomass facilities in the oblast, the FOREST Project hopes to continue to promote biomass energy use and civil society development in the region through the ROLL grants.

As the FOREST Project closes out, opportunities have emerged in the region in support of further biomass energy activities based on:

- new sources of funding for replacing coal and oil with wood for district heat may emerge as a result of Russia's signing of the Kyoto Protocol (effective February 15, 2005)
- substitutions of 150 thousand tons per year of coal
- increasing recognition of the benefits of replacing coal at district heating plants to provide capital for new facilities
- rising electricity tariffs creating incentives for policy reform and new legislation. Given the FOREST experience, companies appear ready to invest in power generation given new laws and adequate tariffs.

6. Lessons Learned and Recommendations

The Biomass Energy Component of the FOREST Project started slowly and initially planned to emphasize transfer of U.S. experience through the preparation of feasibility studies for candidate sites in Siberia and the Russian Far East. Slow progress led to the fielding of a team of biomass energy experts in the region in June 2001. The primary objective of the team was to evaluate the opportunities for biomass energy systems in the forest products industry. Forest harvesting and production of forest products had dropped dramatically in the early 1990s as the large centralized facilities developed during the Soviet period closed. Meetings and site visits helped the team identify leading Russian specialists and revealed the deep distrust of U.S. interests that existed in the region. Russian experience with biomass energy systems was limited.

The team prepared its report and delivered the results to a workshop in Khabarovsk in November 2001. Overall, the team highlighted the importance of the forest products industry to employment and economic growth in the region and determined the two most important barriers to growth in the sector to be the cost and availability of energy and the cost and availability of transportation infrastructure. Discussions during and after the workshop shaped the revised program strategy that focused on identifying industry leaders who had both the interest to move forward with biomass energy systems and the skills to be successful.

The Biomass Energy Team then focused on understanding the economics that led to the collapse of the industry. Successful cultivation of interest from industry leaders would depend on how biomass energy systems could add value to companies already operating in the region. Detailed discussions were held with various industry representatives in Russia and the United States.

Particular attention was given to understanding the problems that most concerned Russian companies. The problem of greatest concern was the ability to burn difficult fuels lsuch as bark and sawdust. Results of economic and financial analyses were presented at a workshop in Vladivostok in June 2002. Investments in systems to dry forest products appeared to offer the shortest payback periods. Returns were most sensitive to capital equipment costs.

During 2002, Biomass Energy Team members began to concentrate on understanding the capabilities of Russian experts and manufacturers. Visits were made to various technical institutes and manufacturers to evaluate equipment and human resources. At the same time, the project solicited proposals from Russian companies interested to develop biomass energy projects and offered financial support for preparation of studies and technical assistance to review the studies that were prepared.

Key to the FOREST Project's success in moving biomass energy projects forward was the ability to build trust and develop sound relations with Russian companies, their design firms, and Russian manufacturers for boilers and turbines. Trust was built through the design review process. The Biomass Energy Team sought to engage leading Russian experts, manufacturer's representatives and international experts in each design review. The first series of design reviews were held in Krasnoyarsk and Irkutsk in March 2003. The participation of a range of experts and the open discussions increased company confidence and revealed potential flaws. It helped companies answer critical questions quickly and focus attention on key areas of risk. Several decided not to move forward with investments. Igirma-Tairiku decided to proceed and started construction.

While international and Russian experts worked with engineers from Igirma-Tairiku to review equipment and design options and to work with Biysk to revise boiler designs, the Biomass Energy Team also began to assemble information on drying issues associated with different Russian timber species. The FOREST Project organized its first major seminar on dry kilns in Khabarovsk in September 2003. Because of the importance of drying to the financial performance of forest products facilities, considerable attention was given to identification and collaboration with Russian drying experts. Seminars on drying were included in the U.S. study tour in April 2004 and further training activities focused on drying were offered in November 2004.

Completion of construction and acceptance testing of the first two boilers at Igirma-Tairkiku took place in October and November of 2003, and marked a major milestone for the Biomass Energy Component of the FOREST Project. Igirma-Tairiku hosted a regional workshop in Novaya Igirma where they described the process they had followed and the challenges they had overcome. Representatives from Biysk, the manufacturer of the boilers attended the workshop. TM Baikal also attended the workshop and later decided to build similar boilers at its facility.

With a base of companies moving forward with projects in Russia, the Biomass Energy Component organized a study tour to the United States in April 2004 where FOREST Project partners could see a wide range of equipment options. The goal was to stimulate additional thinking about design alternatives and encourage further partnerships. Additional companies

moved forward with projects following the U.S. visit and it generated significant interest and new applications for targeted financial assistance.

The final project element was advanced in 2004 with the organization of a Civil Society Workshop in Khabarovsk in November 2004. This workshop brought together representatives from several regions to discuss the needs for heat and power in remote settlements and has led to follow-up proposals for development of financial mechanisms to fund installation of new district heating plants based on biomass fuels.

The Russia FOREST biomass component faced some challenges and constraints as policies and legislation in Russia still do not support cogeneration; there are challenges in connecting to regional/federal grids; and the region lacks funds to replace old heating systems. However, the FOREST Project has put in place a network of institutions aware of the potential benefits biomass energy systems can bring to economic growth and employment in the region and has created substantial good will that could be leveraged for further impact.

III. Cross-Cutting Components

A. Forest Policy and Legal Reform

1. Introduction and Component Goal

The Forest Policy and Forestry Reform was a cross-cutting component that supported the project's four technical components of Fire Prevention, Pest Monitoring, Non-Timber Forest Products and Secondary Wood Processing, and Biomass Energy. The overarching component goal was to assess policies and legislation that would allow the Project to reach its technical goals and identify existing gaps. The component assessed policy and legislation. At USAID's request, the forest policy component was eventually rolled into the actual technical component work.

> The Project's beginning coincided with the drastic reform of the entire Forest Policy in Russia. From 2000 to 2005 the structure of federal and regional forestry administrative bodies was changed three times (Federal Forest Service of the Russian Federation during 2000), Forest Service within the Russian Federation Ministry of Natural Resources during 2003,the Forestry Agency under the Russian Federation MNR as at present). Serious amendments were introduced into the Russian Federation Forest Code of 1997, the Forest Code's new version was reviewed several times.

FOREST assessed several policy and legislative issues with respect to the four technical components:

Component 1 - Forest Fire Prevention

- An analysis of the Russian Federation various entities' policies in the field of forest fire prevention and control;
- Forest fire statistics, their causes in the Project's target areas;
- The legal and regulatory basis directly and indirectly related to forest fires;
- An assessment of the anthropogenic aspects including prevention, detection and control of forest fires and their management within current legislature;

- An analysis of enforcement of existing legal standards on forest fires;
- Forestland zoning as a cause of fires and the need for working with the local people in forest fire prevention;
- Suggestions for changing the legal basis and measures to effectively use existing acts;
- System models for forest fire prevention and public awareness.

Component 2 - Pest Monitoring

- An analysis of the legal basis and the system of pest monitoring at the federal and regional levels;
- Gap analysis in the regulatory basis of pest and disease control;
- An assessment of pest monitoring activities in forest governance;
- The ecological and economic expediency of pest monitoring system application in Siberia and in the RFE;
- Project activities including forest pathology zoning, pheromone monitoring of pest populations to be in harmony with the existing legislation of pest management;
- Improvement of the legal basis as a strategy for organization of pest management.

Component 3 – Non-Timber Forest Products and Secondary Wood Processing

- An analysis of regional policies in wood processing and NTFP management;
- An analysis of the existing legal basis of sustainable forest management, timber and non timber forest products processing and sales;
- Gap analysis in NTFP collection and harvesting for value added wood processing;
- Formation and functioning of the domestic and international markets of timber and non timber forest products;
- The legal aspects of relationships between NTFP harvesters and forest governance bodies;
- The advantages harvesting/ NTFP manufacturing associations;
- Establishment of a system to support those engaged in NTFP harvesting and processing and value added wood processing.

Component 4 - Alternative Renewable Energy

- Policy support in the field of alternative energy sources;
- Legal and regulatory basis of biomass use to generate energy;
- How alternative energies cross sectors (power industry, forestry, timber and wood processing industry, environmental assessment, etc.).

This work was completed in the components and contributed to their deliverables; it helped us to better align the program to make impact. These analyses were discussed at the seminars and were reported at different regional, national and international levels (International Scientific Workshop on Forest Fire Management at the Ecoregional Level; International Experience and New Approaches During Forest Governance Reforms, Khabarovsk, 2003; 'Russian Forests' at the World's Forestry Congress, Quebec, Canada, 2003; Russian Federation Forestry Agency's Council meeting, Moscow, 2005).

2. Summary of Results and Impacts

Forest policy is a strategy pursued by the Russian Government in governing the forestry complex --- to achieve a long-term balance of the country's common social, ecological and economic goals, i.e. sustainable forest management.

Forest policy should be based on:

- The country's administrative system;
- The diversity of forest ecosystems;
- The region's socio-economical and geopolitical characteristics.

Forest policy consists of: a) the society's goals in relation to the forestry sector, b) the forestry sector's goals in relation to sustainable forestry management, and c) individual regional goals.

Forest policy development is a process, whereby society indicates what it expects from the forestry sector and from forestry in the future. Society should be active in this process, assist in conflict resolution, understand conservation issues and overall management so there is a balanced effect. This is part of developing a civil society, however this last aspect should be viewed as currently absent from the process in Russia.

Forest policy should reflect *geographical* (i.e.territorial diversity of the social, economic and ecological conditions), as well as *hierarchical*, the country's political and economic system.

* *Country Level* - general forest policy should be formulated in the form of general (framework) goals and principles to create conditions for the forestry sector's sustainable development

* *Regional Level*- (a federal okrug) universal geographical principles of forest making processes, social, economic and geopolitical goals should be taken into consideration.

* *Federation Entity Level*- (Center of Forest Protection) forest policy is most comprehensively manifested in the form of setting specific objectives, defining the methodologies of meetings those objectives and of implementing a system of activities.

* At the lower levels it should not be *Government* policy, but rather become forestry programs of *municipalities, communities and companies* that are formulated.

Report on 'Forest Policy and Forestry Reform'

In 2001 a report was prepared on 'Forest Policy and Forestry Reform' by a team of experts including E. Kuzmichev, V. Sokolov, A. Sheingauz, and V. Gavrilyeva. The report identified how political and legal instruments could assist FOREST Project in reaching its goals --- gaps in the then present policy and regulatory environment were identified as impediments to FOREST technical components. The report also reviewed issues of the regional forest policy of the Russian Far East, Krasnoyarski Krai and Irkutskaya Oblast, and provided an overall analysis of Russia forest policy.

The report reviewed key documents, in which the principles of the national forest policy are based, such as the Forest Code of the Russian Federation (1997) and the Concept of Sustainable Forest Management (1998), as well as the mechanisms for government funding areas such as forests protection, pest management, and reforestation. In the absence of a national forest policy, entities have been forced to develop policies for their own specific territory, suiting regional conditions. The main problems of those regions were identified.

The report contains a gap analysis of the forest policy that hamper the implementation of the Project's four technical components including Fire Prevention, Pest Monitoring, SWP and NTFPs and Biomass Energy.

Key aspects of the report are as follows:

Forest Fire Prevention

In years with severe fire, losses are several orders of magnitude greater than average years. There has been an increase in the incidence of fire (in size and frequency) over the last 30 years. Specialists believe that since the late 1980's the statistics of tracking forest fires has improved. For example, forest fires have decreased in Sakhalinskya Oblast, whereas they have increased in both Khabarovski and Primorski Krais.

As the U.S. and other western countries' experience shows, a reduction in the number of forest fires takes place as a result of a long-term program's realization. Therefore, the Russian Government should clearly understand that such changes are only possible alongside an education process for society, including the behavioral culture, which is a lengthy process.

In addition to forest policy characteristics associated with the problem, there is also an institutional basis, through which the problem could be addressed. Protecting Russia's forests from fires is a job implemented under two federal branches: 1) the forest administrative bodies in the Russian Federation – leskhozes; 2) and the 'Central Fire Aviation Base. Despite the parallelism of these federal entities, both jointly implement their functions depending on the amount of funding allocated from the federal budget.

Pest Monitoring

The Improvement of Russia's Pest Monitoring System is a mandatory prerequisite of maintaining her forestry resources and ecological potential. The report revealed problems in the pest monitoring organization, some of which it was possible to solve during FOREST's implementation. In particular, the problems include the following:

- establish a system of on-the-ground information support (select key sites to monitor pest populations, develop prediction and assessment maps);
- improve forest pathology survey methods – air-visual, reconnaissance as well as detailed;
- develop forest entomological zoning (identify pest species, natural enemies composition, distribute pest populations by territory);
- conduct an analysis of pest outbreaks as they relate to landscape and ecology, including mathematical models of species and threat dynamics;
- introduce an up-to-date system of woody plants protection from plant feeder insects;
- develop a computer forest entomology database on the basis of GIS and aerial photography;
- identify decision making and defending strategy and tactics with relation to pests

Non-Timber Forest Products and Secondary Wood Processing

The main problems have been identified under this component are:

- Restore and develop the wood processing industry;
- Provide institutional and financial support, in particular, open credit lines, provide guarantees for the most significant projects at the Krai and Federation levels, introduce tax privileges to newly established operations, investment, pioneer use of new technologies/equipment and free them up from taxation and duties;

- Utilize non timber forest products to diversify Russia's forestry complex. Recognize that these products are not an alternative for logging based products, but rather complement and enhance the integrated nature of forest based production;
- The need for change in Russia's export policy; currently round raw log export prevails, unlike Canada and the USA where there is value added processing.

To assist with these problems, the FOREST Project worked to:

1) strengthen associations to build up their capacity to provide service in response to their member companies needs;
2) improve company access to resources that will allow them to expand their production and make high quality products in demand for both domestic and international markets;
3) promote sustainable forest management and integrate the related kinds of ecological services;
4) **attempt to secure both the economic and legal conditions for the forest industry's sustainable development.**

Alternative Renewable Energy (Biomass)

This particular problem goes far beyond the Russia's forestry complex limits, but is also an urgent issue in the RFE and Siberia for two different reasons:

- For many years there has been a problem with utilizing firewood, small wood and other low value merchantable timber and wood wastes which in the past has been discarded primarily;
- *For many years the forest settlements have had difficulty acquiring firewood for fuel. The logging companies have refused to take firewood from the harvesting sites, where it is available in abundance, arguing that that is not profitable for them.*

3. Methods/Approach

FOREST Regional Seminar entitled 'On Forest Policy Implementation Mechanisms in Siberia and the Russian Far East'

During April 16–17, 2002, officials of the RF Ministry of Natural Resources, the regional Governments and Administrations, the leaders of regional Forest Services, researchers, university professors, and NGOs took part in a seminar 'On Forest Policy Implementation Mechanisms in Siberia and the Russian Far East' in Khabarovsk. The goal of the seminar was to identify existing gaps in Russia's forest policy implementation mechanisms with reference to Federation entities in the fields of forest fire prevention, pest management, NTFPs and secondary wood processing. The seminar suggested legal, institutional and technical measures to fill the gaps. While being oriented at the general forest policy problems, the seminar focused its attention on concrete policy mechanisms to address specific issues within the Project's technical components. Below are the results of the gap analysis for each technical area under FOREST:

Component 1: Forest Fire Prevention

Block 1. Regulate forest fire prevention

- Adopt a national forest fire prevention strategy at the federal level.

- Analyze the existing fire prevention concepts and programs, understand the reasons for failure in their implementation, review those concepts and programs, and if necessary, develop new regional programs.
- Develop a mechanism that would secure that forest fire prevention standards and rules to be followed by not just organizations, but also by individuals. Toughen sanctions for failure to obey fire prevention rules in the forest.
- Develop selective forest fire control.
- Develop a legislative act on involving organizations that are not forest users in forest fire control.
- Secure special expense items be included in a regional budget with specific reference to forest fire prevention and control.
- Obtain forest leskhoze buy-in for the reduction in the number of fires; report violations.
- Stimulate public awareness activities.

Block 2. Forest Fire Prevention Education

- Concentrate fire prevention education primarily at the high school level. Acting through education departments in the Federation entities secure that mandatory extra-curricular environmental education be introduced in schools that would provide for teaching rules of fire safe behavior in the forest to children and adolescents.
- Give attention to working with mass media in this area.
- Develop printed 'Rules of Safe Behavior in the Forest' in the form of an illustrated brochure.
- Introduce programs on people's behavior in the forest by involving foresters in the programs' implementation in schools.
- Create and get published series of books and booklets on forest fire topics.

Block 3. Involve Local People in Fire Prevention Activities

- Develop a forest fire public awareness program.
- Through volunteer organizations involve the local people in forest fire prevention and control.
- Provide an ideological and technical and methodological basis for the development of volunteer movement (NGOs, young forest ranger clubs, tourist centers, etc.).
- Use young forest ranger clubs to involve local citizens, especially children and adolescents in fire prevention activities.

Block 4. Public awareness in Forest Fire Prevention

- Create a public awareness system that will operate on the following levels: Federation entities, rayons, leskhozes, and forest user (citizen).
- Establish billboards.
- Hold discussions with the local people through mass media.
- Establish press centers at the territorial forestry agencies to coordinate the activities, develop Web sites and continuously update the information.
- At recreational sites establish demonstration sites with a model set of fire prevention materials.

Component 2: Pest Management

Objectives:

- Mandatory development of an algorithm (methodology) of interpreting and applying pheromone monitoring data to assesses the level of and predict the dynamics of the Siberian Moth population growth, in order to make a decision on the expediency of taking protective measures at the outbreak sites.
- Apply research results in the practical work by pest monitoring specialists.

Mechanisms:

- Develop a program/methodology of forest pathology monitoring organization in the forests of Siberia and the Russian Far East, extensively applying FOREST Project's Component 2 work results.
- Design forest pathology monitoring within one of the Federation entities.
- Organize a series of test plots to conduct a permanent monitoring of the forest's status and dendrophil insects populations in the natural environment.
- Adapt the existing legal documents to the present-day circumstances.
- Develop standard requirements for the entire spectrum of pest monitoring activities.
- Establish centers for forest protection in the Federation entities that are Project areas, primarily taking into account the current forest pathology situation in Khabarovsk krai.
- Establish regional scientific and methodological councils on forest protection to provide consultative assistance and participate in the discussion of the region's most serious problems in forest protection.
- Reference and methodological support for forest protection and planned personnel training and re-training.
- Public awareness of forest protection problems and work with the general public and students.

Component 3: Non-Timber Forest Products and Secondary Wood Processing

Improve legislation tasks and mechanisms:

- Make amendments in the RF Forest Code and, accordingly, in the Forest Codes/legislation of the federation entities that for the most part have come to contradict the realities of the forestry complex governance and forest resources management. The amendments should apply to the following issues:
    - Substantially expand the Federation entities institutions of local governing authority in administering the forestry complex;
    - Recognize the legitimacy of integrated forest management and its priority while transferring forests for lease;
    - Cancel the ban on subleasing;
    - Make it possible to pledge a management right under mortgage;
    - Maintain forest roads.

- Enact a Russian Federation Law on Vegetative Resources and Their Management or a law on Non Timber Forest Products and their sse together with a package of the relevant regulatory acts.
- Develop and adopt the Federal Law 'On Natural Resource Management', it being necessarily focused on the integrated nature of natural resource management.

- Introduce a legal ban on unsustainable and not integrated phyto resource management on sites that are involved in development with severe sanctions envisioned for violations.
- Adopt an act that makes public participation in forest management really possible and mandatory.

NTFP Management:

- Develop NTFP management rules.
- Develop certification standards and criteria for new products.
- Strengthen associations of NTFP users; contribute to the improvement of their corporate image (promotion, websites, support socially significant and promotional projects, etc.); facilitate launching of commercial projects (consulting, trade show participation, etc.).
- Assist in the companies' development (business planning, creation of an investment image, upgrade personnel's qualification, etc.).
- Cancel NTFP exports licensing for the next few years to facilitate their utilization

Information and Innovations:

- In collaboration with the World Bank's Pilot Project establish the Center of Forest Technologies (CFT) that will be responsible for the introduction of innovations and for education and training.
- Establish a Regional Information Center as part of the CFT that will collect and share information on technologies, the domestic and international market competition, etc.
- Provide targeted support for innovation projects on forest resource management, especially those related to forest resources that are currently underexploited.

Financial Regulation:

- Customs duties differentiation aimed at stimulating forest resources value added processing (raise export duties on unprocessed raw ingredients and reduce and even cancel those on value added products; cut down on the import duties on processing equipment).
- Make a drastic change in the system of forest payments.
- Make a drastic change in the forest incomes distribution to different level budgets.
- Facilitate provision of loans to companies engaged in seasonal harvesting, especially NTFP harvesting.

Methodology:

- Facilitate the revision of the methodology of yield calculation and its differentiation by the region.
- Facilitate the development of the methodology of mandatory calculation of the available NTFP resources in forest inventory.
- Facilitate the development of the methodology of taking biodiversity into account in forest inventory and in the rules of logging.

A QUESTIONNAIRE to Determine Forest Policy Mechanisms as They Relate to the FOREST Project's Objectives

Based on the conducted analysis (the report) and the conclusions drawn at the seminar, the Component disseminated a questionnaire to identify forest policy mechanisms related to the FOREST Project's objectives. The respondents were to provide their answers and to rank the forest policy issues according to their importance to the region. Twenty-four respondents took part in the survey, the results are as follows:

Geography:	**Proportion, %**
Vladivostok	**8.3**
Irkutsk	**4.2**
Krasnoyarsk	**20.8**
Moscow	**8.3**
Khabarovsk	**58.3**
Industry Affiliation:	
Federal natural resource services	**29.2**
Federation entities' administrations	**12.5**
Research institutes	**37.5**
Universities	**1.5**
NGOs	**8.3**
Educational Background:	
University	**33.3**
Holder of the Junior Scientific Degree	**45.8**
Ph.D.	**20.8**
Career in the Forestry Complex (# of years) :	
5–10	**16.7**
11–25	**25.0**
26–40	**29.2**
41 and more	**25.0**
Not served in the industry	**4.2**

The first question suggested that the respondents rank the organizational and technical activities from the list by their importance to their respective regions. Forest fires were recognized as highest problem, while fire prevention was placed before fire control. Then the problems of felling and sustainability, prevention of pest outbreaks and natural forest regeneration followed one after the other.

The second was the question about what regulatory and legal activities were required to help solve the problems mentioned in the previous list.

Federal level law making was generally ranked higher than the relevant activities at the regional level.

The largest number of respondents (96 %) answered the question on the need for the official approval of a national forest policy (strategy). A smaller number of the respondents (83%) agreed with the need for the official approval of a Federation entity's forest policy (strategy), and 8 % rejected the idea. More than half of those questioned (58 %) believed that a regional policy should be approved by a local legislative body, 42 % – that that should be done by the head of the executive power body and 4 % – by a local body in charge of the natural resources.

The same 83 % believed that it was necessary to enact new federal laws, and just 4 % of the respondents turned down the idea. Nineteen laws were specifically identified touching upon the following eleven areas:

1. The Fundamentals of Natural Resource Management;
2. Integrated Natural Resource Management;
3. Forest Resource Management;
4. Forestland Ownership;
5. Payment for Forest Resources;
6. Fire safety in the RF Forests;
7. Forest Protection and Pest Management;
8. Reimbursing Forest Users for Involving Their Resources in Forest Fire Control;
9. Forestland Areas Lease for the Purpose of Biodiversity Conservation;
10. Local People's Right to Participate in Defining the Regional Natural Resource Management Policy;
11. The Concept of Promoting Solicitous Attitude to Forests.

79 % of the respondents believed it necessary to develop and approve new rules, guidelines and instructions at the federal level. While assessing the need for changing the federal laws few legal documents were suggested, but those were fundamental ones. The RF Forest Code ranked first - 67 % of the respondents thought it should be altered, and about one third of them directly mention the need for developing a new Code.

Of the local level law making activities the preference was given to developing local rules, instructions and such like (58 % of the respondents). 12 titles of such documents were suggested.

The third question was intended at finding out, what economic mechanisms were required to improve the forest policy. The respondents were almost unanimous in recognizing the need for the forest payments system review, Here they provided 75 % affirmative answers, and the majority of them agreed with the need for changing the taxation system (63 % affirmative answers).

The respondents named 33 mechanisms, of which the following were most generally recognized:

Review the system of payments distribution between budgets of different levels – 33 % of the respondents;

Alter the ration between the export customs duties on round logs (those should be raised) and value added wood products (should be reduced) – 21 %;

Increase forest payments rates – 17 %.

The fourth question was asked to learn what administrative and organizational activities were considered expedient to improve the forest policy.

The establishment of standalone federal agencies – those on forestry and the forest industry (i.e. going back to the old system that existed before 1989in the former Soviet Union) enjoyed the biggest support, but with no more than two thirds of the respondents.
The establishment of a unified federal forestry agency was supported by just 50 % and one fifth of them were against it. To make the activities more detailed, it was most often suggested that the governance system, which has existed prior to May, be restored with the Federal Forest Service clearly distinguished. Another most popular theme was the division of the governance and forestry functions. The following was also suggested:

- To better differentiate between the authorities and the functions of the federal and regional governing bodies;
- To establish the Government system of forest management support;
- To expand the range of governing bodies at the Federation entities' level and, in particular, establish a standalone Governmental Forest Inspectorate;
- To unite all forestry agencies in one body at a Federation entity's level.

Other questions immediately concerned the three FOREST Project technical components' objectives, and they were aimed at finding out what the respondents' attitude was towards those.

Two questions were related to the problems of Component 1 'Forest Fire Prevention'. The first consisted in ranking the activities on forest fire prevention that were listed in the questionnaire from the regional perspective. The respondents thought that public awareness activities were the most important (Ranks 1–2), that were followed by monitoring the situation (Ranks 3–4), and it was after those that activities on building forest recreational zones were mentioned (Ranks 5–8).

The list of suggestions made on the implementation of the most important activities looks as follows:

- Develop and implement a targeted fire prevention program at the levels of the Federation and its entities.
- Expand institutions' of local governing authority to organize fire prevention activities.
- Develop and approve the concept of promoting solicitous attitude towards Nature at the levels of the Federation and its entities.
- Develop targeted federal program on promoting solicitous attitude towards Nature.
- Train specialists to conduct public awareness activities.
- Include a forest fire prevention course in the high school curriculum.

The list of suggestions on protective measures against pests that were ranked highest included the following:

- Develop and provide funding for forest protection programs.
- Develop regional programs on forest pathology monitoring.

- Design forest pathology monitoring projects for each Federation entity on the leskhoze basis.
- Train personnel.
- Introduce GIS technologies.

The final two related problems, were addressed by both the NTFP and Secondary Wood Processing Component and the Alternative Renewable Energy Component. Most attention was paid to regulating exports of products and imports of equipment, i.e. customs control that is under the federal jurisdiction. The emphasis was made on improving the financial instruments.

The survey conducted revealed that the forestry general public viewed the urgency and the importance of the problems facing the forestry complex, as well as the mechanisms of their solution in a similar way. At the same time it was possible to reveal the variety of approaches, obtain new aspects of the latter and of the potential solutions. The extensive materials we managed to get could be used in planning realistic actions to have the forestry complex make a turn to sustainable forest management. They have also helped the FOREST Project define its own activities in the field of forest policy more accurately.

4. Activities and Significance to USAID

It should be noted that this component operated as a standalone for only six months under the cooperative agreement before it was determined to place this work within the technical components.

The Federal Forestry Agency, territorial agencies of the Ministry of Natural Resources, other organizations, and the mass media have all been informed of the results achieved through the work under this component. In fact it was closely coordinated with the Ministry as well as the World Bank.

Thus, the component has made an essential contribution to attaining the technical objectives of the project, facilitating the development of the forestry sector, and creating impact on the development and the reform of Russia's forestry through the federal forest governance.

5. Legacy, Lessons Learned, and Recommendations

Implemented recommendations include:

- Since 2005 the 'Rosleskhoz' has started its own activities in forest fire prevention and public awareness that are funded from the federal budget. The Project deliverables, such as the 'Rosleskhoz' Council approved the project's Manual on how to work with local citizens to prevent forest fires. And, the school program in Khabarovsk and Krasnoyarsk krais have provided a basis for these activities. Involving the local people in forest fire prevention is an important factor of civil society development and one of the few manifestations of the local people's actual participation in the natural resource

management process. This is an area (civil society) where future work may be required in Russia.

- An improved forest pathology monitoring system has been introduced. The regulatory and methodological basis of this work has been replenished with three guidebooks that help conduct the monitoring activities directly in the regions.
- As part of Component 3 activities recommendations on NTFP harvesting have been prepared, approved by the local legislative body and enacted, sustainable and continuous NTFP utilization principles have been developed, and the legal aspects of wood processors' and NTFP processors' associations' functioning have been strengthened.
- FOREST's alternative energy component has been incorporated in the relevant Government programs, and included in the forest complex and biomass power industry development programs in the RF entities.

Both Component 5 activities and those related to forest governance reform that were implemented as part of the FOREST Project's principal components are of sustainable character. The Component's reports, conclusions and recommendations have been transferred to the relevant regional and federal agencies. The developed documents, manuals, guidebooks, reference books and programs have been approved by the federal and regional power bodies and supplied to practical users. The associations, partners' network, information resource centers have been strengthened and provided with the required intellectual and legal resources, and they are ready to continue working individually on the FOREST's key technical components. The primary deliverables have been accepted and applied by Government bodies, regional administrations, businesses, educational institutions and NGOs. The Component's legacy can serve as the baseline for new potential forestry reform projects. Such projects should be based on workplans that set the relevant goals, they should be assessed by applying the developed indicators related to the solution of forest pathology objectives, and should constantly maintain contacts with organizations in charge of the forestry reform.

B. Applied Forestry Research

1. Introduction and Component Goal

Within the project, research was identified as a key component to serve as a management tool to measure results of all FOREST Project components, and to fill gaps in specific areas of knowledge with respect to forestry or the primary components. Within each component, required research was conducted – for example, the Fire Prevention Component conducted baseline surveys, the Secondary Wood Products and Non Timber Forest Products Component conducted market research and the Biomass Component assessed the potential for biomass in Russia with an economic survey.

The main independent work under this component was to establish carbon baseline data for Krasnoyarski and Khabrovski Krais. This research was conducted as a means to assess one of the primary goals of the project -- to conserve and sustain the Russian forests as an important carbon sink. An estimate of forest carbon made at the beginning of the project could be compared to changes in stored carbon as a function of forest cover at the end of the project, to determine the

impact of the program in reaching this goal. Such studies were also expected to benefit the Russian Government by serving as a carbon baseline in the event Russia needed to demonstrate additionally for carbon offset programs/ credits (see Text Box below).

Because of budget cuts from USAID, we were asked to terminate the carbon baseline work after Year Two and we did not complete the originally designed component in full.

Value of Carbon Baseline Data

The Kyoto Protocol allows for the exchange of carbon credits between companies and countries to offset the emission of polluting greenhouse gases. In theory companies will be able to pay for the conservation or planting of carbon based materials which, if not preserved or if not planted would increase the amount of carbon dioxide in the atmosphere which reacts to the greenhouse gases and contribute to the increases to rate of climate change. Sequestered carbon represents less carbon dioxide emitted into the atmosphere, and reduces the amount of heat stored in atmosphere, and in turn, global warming.

Income can be earned through the trade of carbon credits by demonstrating that carbon-based plant life is either being planted or that by some action, existing vegetation, such as forests are being conserved. Carbon baseline data maps are necessary to show the change in land practice for carbon credits.

2. Summary of Results and Impact

The project developed a collaborative research network for measuring changes in greenhouse gas emissions – mainly carbon dioxide ($CO_{2)}$ and changes in carbon stocks in the Russia FOREST Project area. The products created by this component include:

- With the assistance of Woods Hole Research Center, FOREST created a baseline forest carbon map (1:500,000 scale) of the Fire Prevention's target area in Khabarovski Krai
- With the assistance of the V.N. Sukachev Institute of Forest created a baseline forest carbon map (1:500,000 scale) of the Pest Monitoring target area near Krasnoyarsk
- Collection and summary of forest inventory/biomass data for Khabarovski Krai and Krasnoyarski Krai
- Carbon sample plots located on grid in the pest monitoring and fire prevention target areas
- A carbon monitoring plan developed for the pest monitoring and fire prevention target areas
- A manual that outlines the principles of carbon monitoring, including carbon measurement methodologies, for validating digital vegetation maps of Khabarovski Krai and Krasnoyarski Krai

3. Methods/Approach

To build on synergies between project components and to take into account the direct impact on the forest, the carbon maps focused on Krasnoyarsk and Khabarvosk. Krasnoyarsk was selected, because the pest monitoring team started their work there to provide technologies to predict insect pest outbreaks. Khabarvosk was also selected, because the fire prevention team began their work there to reduce the incidence of human caused forest fires.

During the project Winrock worked with local consultants to conduct baseline research, determine **carbon measurement methodologies and establish carbon monitoring baseline maps for Krasnoyarski and Khabarvovski Krais.** In the first year, the team worked with the RFFS, the All-Russian Scientific Research and Information Center for Forest Resources (ARICRF), and other local institutions to identify carbon monitoring methods suitable for the range of forest practices in the project area. Methods explored included establishment of a system of permanent sample plots for monitoring carbon and other environmental indicators. Satellite data and images from aerial remote sensing technologies were used to monitor changes in carbon stocks and the impact of fire and pests on forests. Data from permanent sample plots were used to verify ground-truth data from satellite images.

4. Activities and Significance to USAID

Scientists in Russia and the U.S. assessed forest vegetation land cover as a means to calculate the volume of carbon stored in the forests. Wood Hole developed a 1-km resolution land cover map of Khabarovski Krai (see **Figure 1**) of the Russian Far East that is geographically accurate and in digital format. The map provides 10 landcover classes for modeling the biomass and carbon content.

The landcover map is based on satellite data from 2000 and 2001 and is independent of any previous map of the region. Fifty initial classes were combined into eight classes by comparison with a Russian forest map.

The Woods Hole Research Center submitted digital vegetation and carbon maps for Khabarovski Krai (see **Figure 1**) along with a report on the methodologies used. These maps provide a fresh review of the vegetation of Khabarovski Krai and they capture the complexity of the land surface, the variability of its terrain, and forest fire impacts. The work may be improved by adding data from higher resolution images and other new data readily available each year. Still, these maps represent the best current understanding of the land cover of Khabarovski Krai.

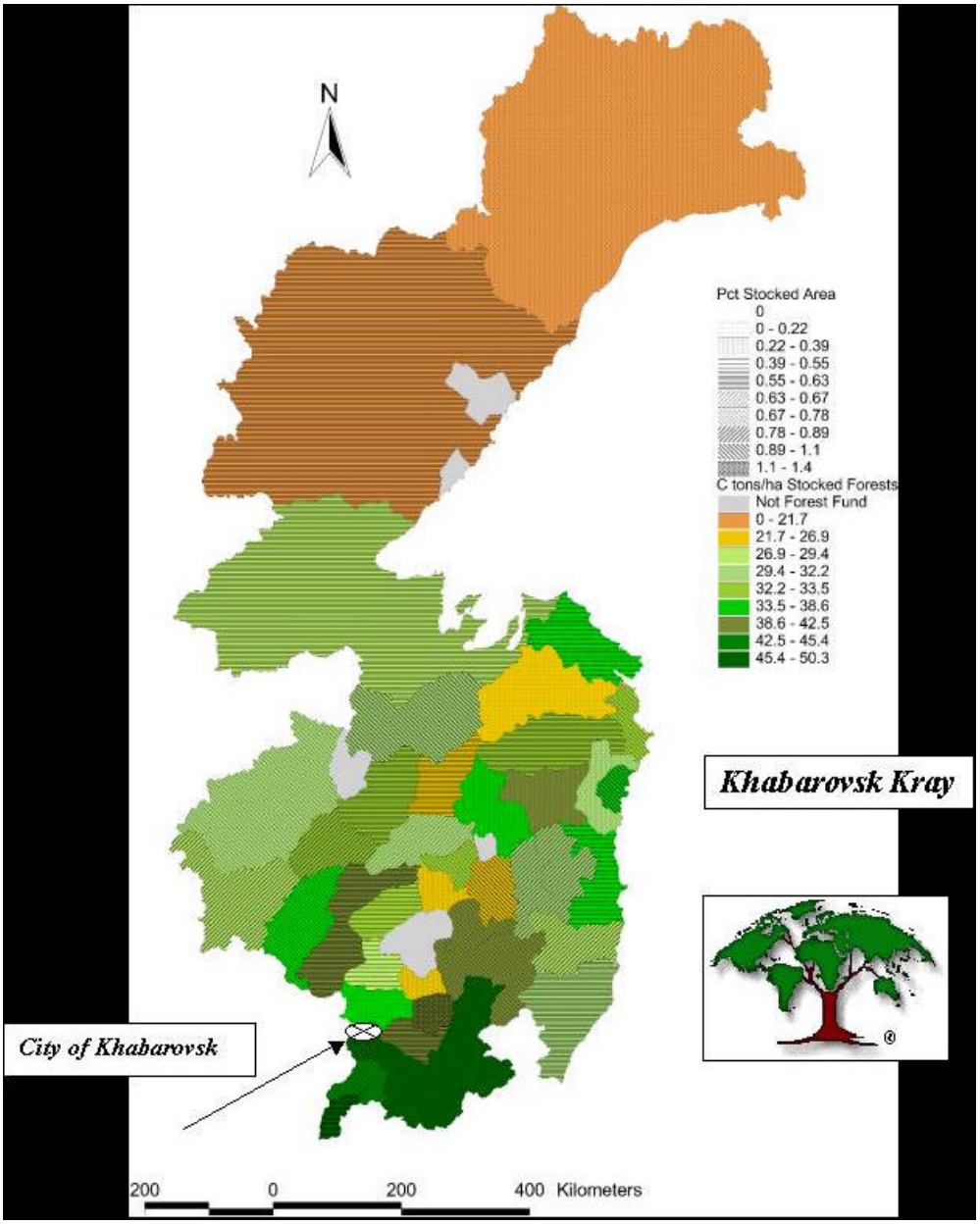


Figure 1. Percentage of stocked area by leskhoz and average tons of carbon per ha for each leskhoz of Khabarovsk Kray. The average tons/ha of carbon (which makes up half the biomass) is higher in the more temperate south and lower in the north. In addition, the average size of a leskhoz is smaller in the south. "Not Forest Fund" areas (gray) are Zapovedniks (strict nature preserves) that allow no forest harvesting. Estimates of more than 100% stocked are due to the disparity between the date of the inventory data and the date of the leskhoz boundary file.

The St. Petersburg Forest Ecological Center and the Far Eastern Forestry Research Center collected and summarized forest inventory data for Krasnoyarski Krai and Khabarovski Krai, respectively. The V.N. Sukachev Institute of Forest, with support from S. Cherkashin developed a digital forest vegetation map of the pest monitoring target area near Krasnoyarsk.

Vlady Alexeyev, D. Efremov and S. Cherkashin collected names of scientists to include in a carbon information network for the Russia Far East. This network helped review and comment on reports produced by the carbon working group.

5. Legacy

Russia has the largest forest carbon sink in the world, and with Russia's ratification of the Kyoto protocol, multinational corporations and environmental groups will become more interested in investing in forestry projects that preserve and increase carbon stocks. However, the value of carbon benefits generated from forestry-related projects will depend in large part on the accuracy of baseline carbon measurements. Through its carbon activity, the FOREST Project has developed a framework for establishing carbon baselines over very large areas, and methodologies for monitoring changes in carbon stocks over time. This information will be essential for measuring the FOREST Project's impact on carbon stocks beyond the life of the project. The carbon baselines and measurement methodologies developed by the project will also be important for developing proposals to attract additional international investment in forestry projects in the Russia Far East.

C. Grants Program

1. Introduction and Component Goal

The purpose of the grant component was to provide funding for activities that directly contribute to the objectives of the FOREST Project and which build upon or supplement other program activities, as stated in the original request for application (USAID/Russia RFA 118-00-008, 2000). Grants were designed and developed to support the technical components. Technical component leaders identified specific needs for grants, developed requests for applications and worked with the grants' manager to advertise the RFA.

The FOREST Grants have supported organizations and businesses in all five regions where the Project operated—Khabarovski Krai, Krasnoyarski Krai, Primorski Krai, Sakhalinskaya Oblast and Irkutskaya Oblast— to conduct activities to support FOREST goals. During the life of the Grant Program there were: 4 grant cycles, 1 targeted financial assistance cycle (projects funded under Biomass Component specifically) and 1 emergency grant. The FOREST Grant Program operated from Year 2 through Year 5, and complied with all USAID regulations pertaining to competitive grant awards. Originally, Winrock planned to disburse UDS$5 M in grants but after Year 3, based on budget cuts, USAID requested that we not distribute any additional grants. Winrock also explored a loan program that USAID decided not to initiate.

2. Summary of Results and Impact

FOREST received 112 prequalification applications during 4 grant cycles and the targeted financial assistance cycle. Out of this, 72 full grant proposals were reviewed and evaluated.

To support the organizations, FOREST conducted 21 seminars on how to write a grant in Khabarovsk, Vladivostok, Yuzhno-Sakhalinsk, Irkutsk, Krasnoyarsk, and Moscow – a total of 165 people participated in these seminars. Training was also conducted on technical and financial reporting for those organizations awarded grants. Twenty-one seminars were held and 72 participants were trained on technical and financial reporting in Khabarovsk, Vladivostok, Yuzhno-Sakhalinsk, Irkutsk, Krasnoyarsk, and Moscow. Thirty three anonymous experts provided support to the FOREST Project Grant Program.

In addition, the Project developed a Grants Manual, Targeted Financial Assistance Program Manual, and Manual on Technical and Financial reporting.

During the life of the grant program 24 grants were issued totaling $560,001 USD. Grantees matched the project funds by providing $147,739.38 USD, or 26% to the total costs. Grants were distributed among the components (see Table 1) and regions (see Table 2):

Table 1. Grant Funding Distribution by Components

Grant Cycle Component/	**I**	**II**	**III**	**IV**	**Targeted Financing**	**Total**
Emergency grant	$25,000					***$ 25,000***
Forest Fire Prevention	$ 29,974	$ 43,789	$ 14,400	$ 58,482		***$ 146,645***
Pest Monitoring		$ 40,000	$ 35,654	$39,100		***$ 114,754***
Non-Timber Forest Products/Secondary Wood Processing	$ 59,975	$ 30,000	$ 21,344			***$ 111,319***
Biomass Energy		$ 53,172	$ 56,537		$52,034	***$ 162,283***
Total	$ 114,949	$ 167,501	$ 127,935	$97,582	$52,034	***$ 560,001***

Table 2. Grant Funding distribution by Regions

Grant Cycle Region/	**I**	**II**	**III**	**IV**	**Targeted Financing**	**Total**
Khabarovski Krai	$ 84,974	$ 15,000				***$ 99,974***
Krasnoyarski Krai	$ 29,975	$ 41,469	$ 51,183	$68,746	$16,034	***$ 207,407***
Primorski Krai		$ 40,000		$28,836		***$ 68,836***
Irkutskaya Oblast			$ 41,098		$36,000	***$ 77,098***
Sakhalinskaya Oblast		$ 71,032				***$ 71,032***
Moscow Oblast			$ 35,654			***$ 35,654***
Total	$ 114,949	$ 167,501	$ 127,935	$97,582	$52,034	***$ 560,001***

Grant Topics

Emergency Grant

October 1st 2002, Khabarovski Krai Administration made a request to FOREST Project for an Emergency Grant to buy equipment to fight forest fires during an especially destructing fire

season. The request was received from the Khabarovsk Regional Branch of Non-Governmental Organization *Russian Community of Foresters*. The FOREST Project was able to get approval from USAID and by October 10th, provided a grant of $25,000 to purchase fire fighting equipment including:

- 12 motor pumps
- 150 sleeping bags
- 200 axes
- 550 shovels

These materials and equipment were purchased and distributed among 13 forest districts of Khabaroski Krai.

Other grants topics were developed by the component leaders and are mentioned within each component's report. The accomplishments are also mentioned in detail below. Activities funded under the Grant Component included:

- Forest Recreation Area Development.
- Establishment of Resource Center for Promotion of Forest Fire Prevention
- Forest Protection Management System Development for Leskhoz of Primorski Krai
- Handbook Development on Methods of Forest Pests and Diseases Monitoring
- Development of Forest Pathology Management Plan for Krasnoyarski Krai
- Resource Information Center Development (Khabarovsk, Krasnoyarsk)
- Instrumental Center Development (Yuzhno-Sakhalinsk)
- Introduction of Non Waste Technology of Provision and Processing of Wood and Wood Waste Products of Fir Plantings
- Feasibility Study Development for the Construction of Cogeneration Plants Operating on Wood Waste and its implementation.

Forest Recreation Area Development

As per the RFA, the grants component, in collaboration with the Fire Prevention Component requested applications to develop rest areas in heavily used forest areas. These rest areas would include parking lots, raised metal fire pits for cooking shashlik, benches, canopies, fire extinguishing tools, grills, toilets, garbage containers, sport places, and information stands (using FOREST Project materials). and also to conduct contests and seminars. Grants were issued to develop eight recreation areas in the following regions:

- Yuzhno-Sakhalinsk - 1
- Khabarovsk - 3
- Krasnoyarsk - 1
- Irkutsk - 1
- Vladivostok - 2

Approximately 28,000 people visit 43 recreation areas per year. All recreation zones were transferred to local leskhozes to maintain and manage them.

Establishment of Resource Center for Promotion of Forest Fire Prevention
The goal of this grant was to store and disburse materials developed under the FOREST Fire Prevention Component for the Krai and District administrations, schools, and NGOs.

The grant was realized by:

- implementing school educational programs;
- conducting training seminars for forest guards and additional education specialists;
- cooperating with Mass Media;
- conducting mass campaigns;
- and working with targeted population groups.

Results:

- 3 training seminars conducted for teachers (104 people);
- 5 training seminars for State Forest Service employees on organizing public relations (150 people), participants received souvenirs, hand outs and promotional materials for mass campaigns conduction in Krasnoyarski Krai;
- 400 school education programs distributed through seminars and the Forest Museum, 150 educational programs were given to employees of forest protection services;
- forest fire prevention campaigns were carried out by volunteers (junior forest rangers and students of Divnogorsk forest-college) - 50000 handouts were given out;
- and all leskhozes of Krasnoyarski Krai received audio and video materials for local broadcasting.

Forest Protection Management System Development for Leskhoze of Primorski Krai.
The project goal was to develop a system of local forest pathological monitoring for two leskhozes of Primorski Krai. Results:

1. Forest Protection Management System was developed for Arsenievsky and Melnichny leskhozes.
2. *Institute of Geography FED of RAS* developed 9 electronic maps for territory of Arsenievsky and Melnichny leskhozes of Primorski krai (1:100 000).

Development of Forest Pathology Management Plan for Krasnoyarski Krai
A feasibility study was developed for Krasnoyarski Krai to asses forest pathologies. Information was received on current forest pathology conditions at the time of project implementation. Within the project framework the revision and placing of 289 sample plots was done. Also, the monitoring method was developed during the field data collection. Based on GIS information and modern computer programs, ways and methods of forest pathology monitoring were outlined in Krasnoyarski Krai and the Economic evaluation of possible damage from forest pathology factors was compiled.

Handbook Development - Forest Pests and Diseases Monitoring
The grants component funded the development of a handbook describing all the basic methods of monitoring forest pests and diseases. The handbook was based on existing documents, reference

books, and with participation of the leading specialists in the sphere of forest protection. The handbook is illustrated with colored photos.

Resource Information Centers (RIC) Development (Khabarovsk, Krasnoyarsk)
Krasnoyarsk
Two Resource Information Centers were created through the Grant Component to carry out the work established with the associations under the NTFP and Secondary Wood Processing Component of FOREST. The two centers provide information and education services for businesses and NGOs.

In Krasnoyarsk, the RIC was created as self-sustained entity of the *Siberian State Technical University*, where they provide office space and staffing The center has helped attract investment and for a fee provides marketing services for timber industry companies, data on specialists working in the timber industry, information on recreation zones and tourist routes, and information on forest resource use in the Krai. In addition, the Center has developed a business model for a the secondary wood processing company with the help of a grant of 100,000 Rubles ($3500) from the Federal Agency of Education (Ministry of Education and Science of Russian Federation).
To Summarize the RIC in Krasnoyarsk provides Services in:

Marketing
- Market study (materials on current and forecast marketing needs)
- Sales (from searching the contact to contract implementation and prolongation)
- Procurement

Consulting
- Investments attraction
- Business planning
- Management system enhancement
- Certification of products, services and processes

Trainings and seminars
- Trainings on professional development
- Seminars on forestry
- Search of trainees for partners

Publications
- Collection of forestry standards
- Strapper's manual
- Chokerman's manual
- Reference manual for exporters of timber
- Reference manual on loading timber on a goods car
- Conferences materials

In Khabarovsk, the Resource Center supports organizations and individuals in the forestry and woodworking industry. The RIC was officially registered as a Non-Commercial Partnership of *Far Eastern Association of Wood Processors* and *Far Eastern Chamber of Commerce*. The partnership created a web-site for the Khabarovsk Resource Center at www.lesdv.com .
Since September 2003, the center provides consultations and informational services.

The center conducted a number of seminars and trainings on the following topics:

- certification of force-majeur conditions confirmation;
- how to manage a company;
- entrepreneurial protection and struggle against counterfeit;
- foreign export organizations, specialized in inspection of Russian timber-export;
- voluntary product certification according with Law of Technical Regulation;
- "Issues of intellectual property protection: trademark development, registration, protection";
- "Automatic Identification UNISCAN, product coding, keeping of electronic catalogs, data exchange";
- customs rules of timber declaration.

Staff of the RIC actively participate in international meetings. The RIC is collaborating with:

- *Union of Lumbermen and Timber-exporters*;
- Administration of *Far Eastern Exhibition Center, LLC* (in conducting the annual exhibition "Timber and woodworking industry");
- *Institute of entrepreneurial problems*, Khabarovsk branch (center is getting information-research services)
- and the Khabarovski Krai Government.

Instrumental Center Development (Tymovsk settlement, Sakhalinskaya Oblast)
The Grants Program supported the development of a center that provides training on sharpening saws to association members and outside companies of Sakhalinskaya Oblast. As a result, 30 specialists were trained and 60 saws were maintained earning the center 72750 Rubles ($2425). In addition, Parusnovsky woodworking enterprise increased its labor capacity by 20% after training three specialists in the Sawfiling Center.

Introduction of Non-Waste Technology in Processing Wood Waste Products of Fir Plantings
This grant introduced technology to use wood waste of fir needles to develop four high value products - fir oil, Florentine water, natural coniferous extract, and coniferous flour.

Feasibility Study Development for the Construction of Cogeneration Plants Operating on Wood Waste and its Implementation
To support the Biomass Component, seven grants were issued to conduct feasibility studies on biomass facilities. Companies such as *Parusnovskiy DOK* (Sakhalinskaya Oblast), *Yartsenskiy LPH* (Krasnoyarski Krai), *JV Igirma Tairiku* (Irkutskaya Oblast), *TTS-Les, LLC* (Krasnoyarski Krai), *Miklescom, LLC* (Irkutskaya Oblast), *TM Baikal, LLC* (Irkutskaya Oblast), *Kamenskoye, LLC* (Krasnoyarski Krai) conducted the studies and as a result five companies are in the process of completing construction of power plants and power stations.

The grants program played an instrumental role in helping the four main technical components achieve their results during the project.

3. Methods/Approach

The Grant Program was developed to support activities of the four technical components of the FOREST Project. Component leaders identified grant activities that supported their component, FOREST staff reviewed and evaluated proposed topics, and then sought approval from the Advisory Council. Grants have been allocated in each region the Project operated and each component was awarded at least 10 % of the grant funds during the FOREST Project implementation.

To be eligible to receive funds, the applicant organization needed to meet the following qualifications:

- be a Russian organization registered according to Russian Federation legislation;
- not be a religious or political organization;
- not be a government agency;
- demonstrate ability to manage grants in a sound manner;
- implement activities which will not result in profit for the organization;
- submit a complete application with a project description that promotes FOREST Project goals and implementing objectives;
- contribute at least 10% of total grant amount in funds or assets to the grant project.

The FOREST Grant Program did not fund:

- equipment that is not explicitly required in the RFA (equipment may be purchased only to support the grant activities and grantee must follow USAID procurement regulations);
- personnel or administrative expenses are not related to the project;
- activities that harm the environment or discriminate against women;
- activities that are already funded by other sources;
- or foreign companies operating in the Russian Federation.

Grants followed a specific cycle and were awarded twice a year (see Table 3 and Table 4).

Component leaders developed approved topics into descriptive Requests for Applications. Request for Applications were published in relevant newspapers.

Interested organizations submitted brief preliminary applications, which allowed Winrock to ensure the organization had minimum financial requirements for managing a grant and to propose an appropriate activity. Applicants that met minimum requirements were requested to submit a full application and budget.

At least two independent anonymous experts as well as other Winrock International staff reviewed each application. Applications were objectively evaluated according to the standard criteria. All applications were ranked, with the highest ranked recommended for grant award. Following the evaluation, both USAID and the Advisory Council approved all proposals.

Two training seminars were conducted to build the capacity of the applicants. One was an optional free training on how to meet preliminary criteria (applicants are responsible for cost associated with training seminar such as travel and lodging). The second training was mandatory for grantees on how to report on the progress and finances.

Table 3. Steps in Grant Cycle

Step	Activity	Dates	Occurrence	Description
1.	Grant portion of the project obligated	March-May	Annually	Based on proposal and congressional approval, USAID will obligate funds for the Cooperative Agreement. FOREST staff determine grant allocations.
2.	Component Leaders draft Request for Application (RFA) topics	March-May	Annually	During the workplan process, Component Leaders develop and substantiate ideas for RFAs for the coming year in support of their component.
3.	RFA topics reviewed by FOREST staff	May	Annually	RFA topics reviewed to ensure the results of activities will contribute to FOREST Project and component goals. FOREST staff ensure that allocation meets guidelines.
4.	RFA topics presented to Advisory Council	June	Annually	RFA topics shared with the Advisory Council for their input (ensure no duplication of activities from other projects/resources).
5.	RFAs drafted, approved and published.	June, Dec	Biannually	RFA announcements drafted and advertised to submit prequalification applications.
6.	Prequalification of applicants	Jul-Aug, Jan-Feb	Biannually	Applicants prequalified based on submission of brief application describing institutional capabilities and program ideas (limit of two pages, plus attachments).
7.	Invitation for full proposals	Aug, Feb	Biannually	Component Leaders issue invitation for full proposals to prequalified organizations.
8.	Training for applicants that have been prequalified	Aug, Feb	Biannually	Component Leaders and Grant Manager conduct training session on FOREST grant proposals, project and financial management and reporting requirements.
9.	Review and approval of grant applications	Aug-Sep, Feb-Mar	Biannually	At least two independent anonymous reviewers score and rank each proposal based upon the evaluation criteria outlined in the RFA. Component Leaders also score proposals. Recommended list presented to Advisory Council for their concurrence. Report of recommended grantees submitted to USAID for final approval.
10.	Grant agreement approved	Sep, Mar	Biannually	Winrock Director of Contracts approves grant agreements.
11.	Grantee training	Sep, Mar	Biannually	Grantees receive mandatory training regarding financial and technical reporting requirements.
12.	Disbursement (ongoing)	On-going	Monthly	Grants disbursed according to budget presented and approved in the grant proposal.
13.	Progress and financial reports	On-going	Monthly	Progress and financial reports required and must be submitted prior to next disbursement.
14.	Impact monitoring	On-going	Monthly	Staff on-site visits begin immediately following the first disbursement according to need and risk.

Table 4. Timeline

Event	Time Period in weeks	Total Elapsed Time
RFA Announced	Timeline Begins	0 weeks
Pre-Applications Due	2 weeks	2 weeks
Prequalification Complete	1 week	3 weeks
Full Proposals Due	4 weeks	7 weeks
Proposal Evaluation Complete	3 weeks	10 weeks
Recommendation List Given to Advisory Council	1 week	11 weeks
Submitted to USAID for Approval	1 week	12 weeks
Grant Agreements Finalized	1 week	13 weeks

D. Volunteer Program

1. Introduction and Component Goal

Volunteers are professionals who provide technical assistance and their experience on pro-bono basis, however do receive a per diem to cover their basic costs. Specifically, volunteers are sent to conduct short term assignments, help to find solutions to accelerate the development process that will result in increased productivity, higher quality goods, new jobs and higher standards of living for the communities. In many cases, volunteer experts provide entrepreneurs with the knowledge they need to improve, help train Russian counterparts to obtain new skills, create advanced ideas and expand options and opportunities. Volunteer assistance is new knowledge transferred, skills obtained, and new attitudes developed. The Volunteer Cross-cutting Component provided technical assistance mobilizing skilled qualified experts, both local nationals and US volunteers.

The primary goal of FOREST Project Volunteer Component was to bring focused technical expertise as needed in the four technical components: Forest Fire Prevention, Pest monitoring, Non-Timber Forest Products and Secondary Wood Processing, and Biomass Energy. Thus once again the component's aim was to support the overall FOREST Project goal of sustainable forest management for Russia. Having said this, it is still important to note that the Volunteer Component was implemented in a demand driven manner. The component's activity was guided by the demands and needs of project components in fulfilling their tasks and achieving primary their goals, such as implementing fire prevention advocacy programs or training biomass technicians.

The focal points of volunteer assistance have been linked to component goals and tasks; problems identified by components, staff, advisory council and working group members have been implemented with the goal to solve the issue through volunteer technical assistance. Every volunteer assignment targeted a project result, and to make the most effective use of project volunteer, FOREST stressed the following during volunteer cross cutting implementation: 1)identify priority areas and sectors to focus efforts; 2) identify solid partners and potential hosts; 3) identify needs and opportunities; 4) develop processes to implement volunteer technical

assistance. Technical assistance priority areas were generally identified by Technical Working Groups and the component leaders in conjunction with Federal Forest Service of Russia, Russian Academy of Sciences, Khabarovski Krai Forestry Ministry and FOREST's partner organizations, and they were inseparably linked with the major targets of project components.

During implementation for FOREST, the Volunteer Cross-cutting Technical Component focused on:

1. Capacity building of partner NGOs to implement public awareness programs and fire prevention campaigns to change behaviors and attitudes of people and to reduce the human-caused forest fires; the development of recreation zones.
2. Pest monitoring methodology to track forest insect pest populations to prevent pest outbreaks; public awareness campaigns to minimize the loss of pheromone traps.
3. Association strengthening and capacity building; increasing the value of forest products as a means to discourage over-harvesting of forest products.
4. Biomass energy - increasing the interest and awareness among the companies of the Russian Far East and Siberia; assessments of biomass that can be used to develop additional biomass energy
5. Training for the grants cross cutting component.

Naturally, the focus of technical assistance continually adapted as the needs of the program changed over time. New areas were identified and added when new associations became more organized, joined FOREST, and reached a more sustainable level. New goals were set as the results were assessed; this ensured a striving for continued growth and development through our volunteer cross-cutting component.

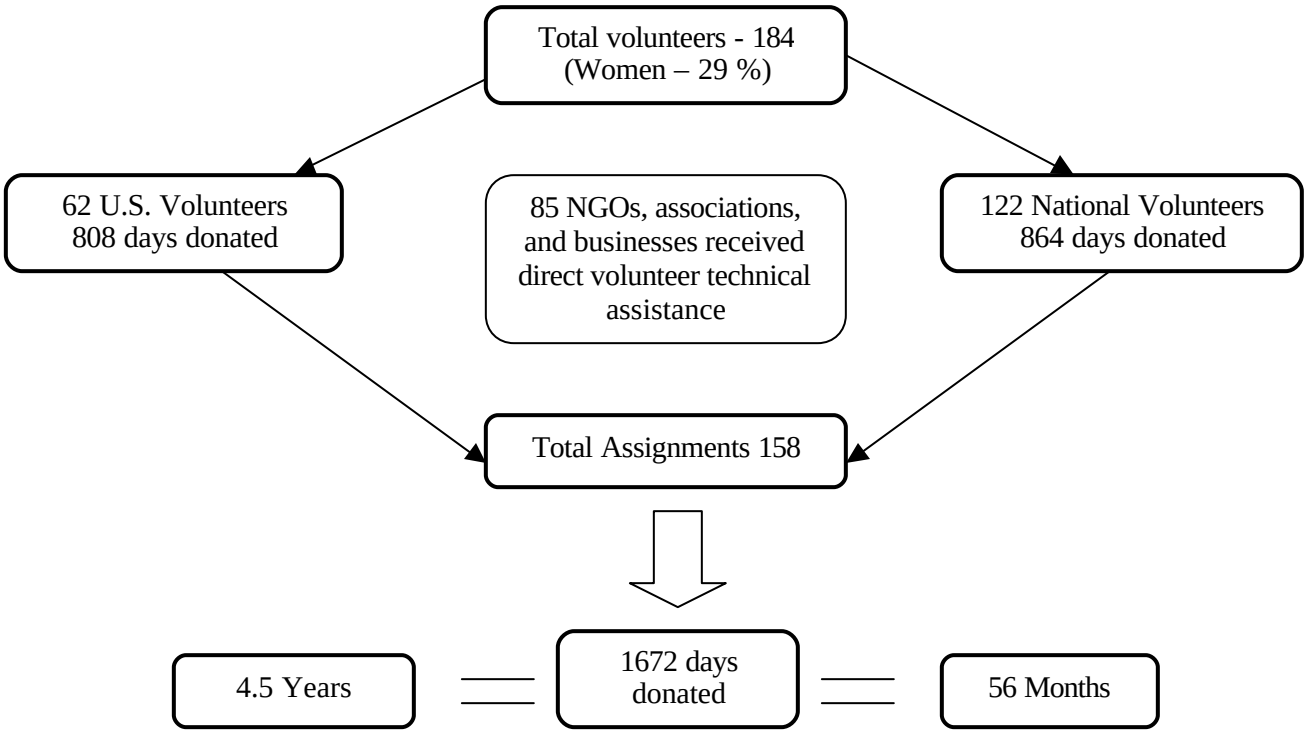
2. Summary of Results and Impact

Generally, the key role of the Volunteer Component was to insert the right volunteer with strong expertise -- to the right company -- at the right time. Volunteers in most cases were used to accelerate, or to improve the development and bring tangible results within the framework of overall project goals. As this component was not a stand-alone activity, it actually intergrated into the four technical components – Forest Fire Prevention, Pest monitoring, Non-Timber Forest Products and Secondary Wood Processing, and Biomass Energy helping them to to achieve macro results.

During implementation of FOREST, our volunteer experts have been a flexible and responsive resource assisting with:

- supporting the component activity;
- solving urgent technical problems;
- and providing narrow-field consultancy.

Through this USAID supported program, FOREST as managed by Winrock International, mobilized both U.S/ and Russian national volunteers. The total number of fielded volunteers and days donated is demonstrated below:



As mentioned earlier, the Volunteer Component was not a stand alone activity as it was cross-cutting. It was inseparably linked with project components, supporting the component activity and adding the contribution of volunteers to achieve results. Impacts resulted from the volunteer assistance were further developed by other project activities and were appropriately reflected within the relevant component. Volunteer technical assistance was flexible and highly responsive to changing needs and demands of project components. Supporting the requests of components volunteers took part almost in all project activities contributing to fulfill component tasks to achieve the project goal.

In many cases volunteer support and assistance was at the start of successful development of FOREST partners such as the star success of Voyage, Forest Line, Forest Products, Parusnovsky DOK, and Malakhite. Volunteer expertise helped to improve production and marketing, develop management skills, and introduce efficient manufacturing. Volunteer efforts contributed to overall project results in jobs created, increased sales and productivity, expanded production volumes and value-added manufacturing introduced.

Volunteers assisted in improving the performance of 21 companies, developing strategic plans, business plans and feasibilities for 6 companies and 5 associations, developing recipes for 38 new products, developing 31 package designs, improving products quality for 10 companies, providing project assessments to 19 companies, developing market strategies and market analysis to 9 companies, solving narrow field engineering problems for 7 companies, developing master plans for 5 recreation zones, supporting forest fire prevention campaigns, developing two web sites, and developing 47 items of marketing material (brochures, products sheets).

In addition, volunteers conducted 33 workshops, trained 620 participants, and provided individual consulting to 115 companies. However, the benefits of Host organizations are not limited to improved manufacturing and enhanced skills. Volunteers promoted mutual understanding at a grass roots level, built professional connections, and developed long-term relations between Russian and the U.S. businesses and organizations.

3. Methods/Approach

While implementing FOREST, the Volunteer Component followed the approach of: a) complimenting and enhancing Russian expertise through pro-bono technical assistance, b) focusing on areas that could yield measurable and realistic results and lead to achieving the macro project goal of sustainable forestry management.

Two constraints encountered were: 1) potential Hosts were very sensitive to the fact that the assistance will be provided by the US volunteer experts that "will come to teach"; and 2) they were skeptical that the U.S. experts could bring effective assistance with the challenges and problems that exist in Russian economy. As a result, it was stressed that the volunteers come to share experience and not to teach, and to work together to find solutions.

In the beginning of the volunteer program, U.S. volunteers were the primary resource, however Winrock International pioneered utilizing Russian National volunteers during the final two years of the project. This innovation met with a positive response from Russian professionals, specialists of local universities and experienced practitioners with strong background agreed to volunteer to share their knowledge and expertise in the FOREST Project.

The Winrock database was the key source to recruit U.S. volunteers. The work was conducted through a U.S.-based recruiter, and the Volunteer Component leader was responsible for communicating with the US-based recruiter for mobilizing US volunteers. Later the Volunteer Component leader was responsible for recruiting national volunteers.

Whether a U.S. or national volunteer was used depended on the assignment objectives and client requests. U.S. volunteers helped to accomplish tasks when their expertise on business and association development was requested. They were an invaluable resource to consult on association management tools and advocacy policies. U.S. volunteers helped to enhance the skills of association leaders and members in presenting their company and products in a market-oriented and effective way, worked on improving their ability in contractual negotiations, provided trainings on negotiating process from opening to closing deals, and discussed the effective tools and tactics that would lead to a particular result. Assistance in preparing for study tours, trade shows and expos were also provided by the U.S. volunteers.

National volunteers assisted with solving urgent problems concerning equipment maintenance, narrow-field assistance in improving technology, or product quality. This approach was justified when urgent assistance was needed but the arrival of a U.S. volunteer was delayed due to visa formalities, or as used in a team approach pairing a U.S. volunteer with a Russian volunteer providing dual expertise and additional capacity building.

Volunteering became recognized among association members as a method to get results and promote development. Association members agreed to volunteer to solve problems and assist other members. For example, a specialist of Region 7 association volunteered to provide assessment on the opportunities for inter-association collaboration of Siberian NTFP Association and Region 7 Association. After the areas of cooperation were identified, a contract involving three companies from the Siberian NTFP Association (*Ecovit, Rodnik, Akonit*) and *Vostokbioproduct* of Region 7 Association was signed. The development of inter-association linkages was promoted on a volunteer basis. Assisting each other also helped to develop collaboration between companies and members of the Siberian NTFP Association. A specialist from *Matur* volunteered and trained the staff of *Manskaya Dacha* on mushroom processing technologies to fill a big contract (US$55,600). In this particular case, the contract was too large for any of these companies to fill individually, and so the association members - former competitors - united and were successful. This result was achieved through volunteer assistance.

The Scope-of-Work, Volunteer End-of-Assignment Report, and Follow-up Impact Survey were the tools to ensure a simple, cost effective, results-oriented process of the Volunteer Component. It should be mentioned that the scope of work (SOW) as a formal request for technical assistance contained detailed information on the technical assistance need, defined assignment objectives, and identified expected results. The detailed information was used to select the most appropriate volunteer and to obtain the best match between the volunteer's expertise and requested skills. The detailed SOW also helped to fully orient the volunteer prior to mobilization. SOWs were developed upon a request of the Host which was submitted through their association. This approach enhanced the role of the association and the association key staff became familiar with association members issues. After the request was received from the association the Volunteer Component and the relative component leader considered if:

- the assignment objectives corresponded to the projects goals
- the assignment objectives met the tasks of the component work plan
- the assignment was doable and realistic
- the assignment would bring tangible results

Before the assignment started the Volunteer Component prepared the Host to work effectively with the volunteer. The Host was given tips on how to organize work, schedule time to work together with the volunteer, or assign staff to be responsible for this. Issues on how to help the volunteer acclimate to the new environment in a minimum amount of time were discussed. This pre-assignment work helped to avoid the mind set that a volunteer was "a miracle maker".

Although the volunteer technical assistance was pro-bono, Hosts were asked to contribute to the expenses for either lodging or the interpreter. With this approach the Host had a direct interest in getting a favorable result and therefore to work with the volunteer in the most effective way.

The Technical Working Groups and component leaders helped to identify potential Hosts and assignments. With the Non-Timber Forest Products and Secondary Wood Processing Component - needs and areas for volunteer technical assistance were identified through company surveys. Association board of directors actively joined the process of getting the info on companies and association members. This method helped the association key staff to learn the challenges,

products, and opportunities of association members. The surveys identified the following areas for supporting associations and their members:

Associations:	**Association members:**
Strategic planning	Value added manufacturing
Association management	New technologies
Developing budgets	Obtaining financing
Developing work plans	Increase profits
Funding and grant writing	Product quality
Association marketing to increase membership	Marketing strategies
	Packaging developments

To effectively utilize volunteer assistance and obtain results, criteria for Hosts were developed. Meetings with the companies showed that they either didn't recognize the benefits of volunteer technical assistance, or falsely believed in a "magic pill" that would be brought by the volunteer and would solve all the company problems. In order to better tackle these issues, the potential benefits of volunteer technical assistance needed to be explained, and criteria for Host selection was imperative to ensure the effective assignment.

At association annual meetings the Volunteer Component leader explained the procedures, techniques and potential benefits the company could obtain through volunteer technical assistance. Brochures to increase awareness and show available opportunities through the volunteer program were given to component leaders and association key staff to be distributed to project partners and association members.

Regarding the Host criteria, the following was developed:

1. to have a clearly defined and realistic goal;
2. to be open to innovations and new knowledge;
3. to realize that volunteer is not a "miracle maker", positive changes will come through efforts and hard work to be done by the company under the expert/consulting guidance;
4. to be financially sustainable to implement recommendations.

The success of the first assignment helped to overcome the skepticism and proved the value of the volunteers.

Volunteer pre-assignment briefings were conducted upon arrival in-country the aim being to clarify specific issues before the assignment began. The Host was always a part of the pre-assignment briefing. During the assignment the Volunteer Component staff contacted the Host and the volunteer at the end of the day to monitor progress.

All volunteers were debriefed after the assignment was completed. Debriefing was conducted after the volunteer completed his final recommendations and the company key staff studied the material. Debriefings allowed discussion of key accomplishments, concerns and potential results.

The information contained in volunteer EOA reports was crucial to document the assignment impacts. They also defined areas of further assistance and constraints encountered by project partners. In most cases the volunteer was requested to submit the EOA report by the end of the

assignment. In this case the Volunteer Component and the company staff could study the reports and discuss or clarify the issues if needed. The section of how the objectives were achieved, and what further steps were required was of great importance. FOREST Project staff worked closely with the associations and their members to monitor and follow up on implementing the volunteer recommendations. The data on expected results was placed into the Volunteer Component's tracking table for monitoring and resources contributed by the Host were also noted. Winrock field office staff in Krasnoyarsk and Yuzhno-Sakhalinsk were trained to assist in implementing the Volunteer Component in their areas and to help with logistical arrangements for volunteers.

Volunteer Performance Evaluations helped to evaluate the volunteer's skills and expertise for performing future assignments. The major criteria for a volunteer as a perfect match for the assignment were:

- strong professional expertise;
- strong consulting skills;
- sufficient knowledge about the economy of Russia;
- and flexibility.

Monitoring aimed at tracking results to improve and refine the activity was conducted on a regular basis. The tools included simple surveys, terms of references, and volunteer end of assignment reports. Monitored data showed how companies that received volunteer assistance have progressed and what problems they now have. Association key staff and host companies were actively involved in monitoring and evaluating the results of their activities. Through monitoring lessons were learned, implementation was continually assessed and summarized, and new component activities were identified. Deliverables and outputs resulting from volunteer assistance were reported on in monthly, quarterly and annual reports as a part of the relevant component activity.

4. Activities and Significance to USAID

The following are some of the activities by component, undertaken by the Volunteer Component in support of FOREST Project goals.

Public awareness campaigns and changing behavior under the **Fire Prevention Component**, was one of the project tasks actively supported by volunteer assignments. Volunteers helped in building capacity of those partner NGOs that were identified as having the interest and resources to conduct public awareness campaigns on forest fire prevention for the long term. The seminars on strategy, organization building, fundraising, and effective public campaigns were provided. Schools, communication channels for increasing awareness of forest fire prevention, also received volunteer assistance. In total 5 scenarios of fire-prevention-focused ecological events were developed by volunteers. A scenario developed by the National volunteer for a joint Ecobus tour with children and adults from two local NGOs on Sakhalin earned the interest and approval of Sakhalin Energy and was partially funded

Following the recommendations of a volunteer, the Khabarovsk Office of the Russian National Environment Protection Society conducted a FOREST-funded fire prevention public awareness campaign, organizing 42 public events on forest fire prevention. The activity was approved by Khabarovski Krai Administration.

by them. Volunteers recruited from a local television company assisted in producing a video clip on forest fire prevention. Eight volunteer assignments were focused at developing recreational zones. Five landscape design plans were developed for recreation zones of Eco-Park Amur, Sosnovka, Komsomolsk and Bolshe-Khekhtsir reserve in Khabarovski Krai and Bereyzovaya Roscha in Krasnoyarsk. The developed plans emphasized that recreation zones would raise awareness of forest fire prevention. With all these activities volunteers contributed to efforts to change people's behaviors to reduce forest fires.

By request of the **Pest Monitoring Component**, volunteers assisted in assessing forest pathology conditions and implementing the monitoring for the Siberian moth in Primorski Krai and in Sakhalin. The volunteers also led the awareness campaign to minimize the loss of pheromone traps. Junior Forest Rangers were involved to conduct the campain and explain the role of pheromone traps. As a result of the campaign the loss of traps decreased from 20% to 4%.

Volunteer assignments performed by request of the **Non-Timber Forest Products and Secondary Wood Processing Component** made up 73% of total during LOP. The areas of component activities were strengthening associations and businesses through trainings and individual consulting.

Association strengthening involved increasing the capacity of associations and developing their ability to carry out activities on regular basis after the FOREST Project ends, in effect making associations financially viable and more effective representatives for their members' interests. The Volunteer Component focused on developing the organizational capacity of an association, by training is areas such as management skills, fundraising, marketing, service provision, networking, and advocacy. Assistance with strategic plan development was ranked as a primary task. Five workshops on association strategy building were conducted with the assistance of U.S. volunteers. Siberian Wood Processors' Association, Region 7 Association, Krasnoyarsk (Siberian) NTFP Association, Sakhalin Wood Processors' Assocation and Russia Far East NTFP Association had separately organized strategic planning exercise workshops. The workshops helped define the following constraints encountered by associations: 1) associations lack "knowledgeable" leadership; 2) association members have unrealistic hopes that "the expert" who will tell them what to do and where a source of funding may be found; 3) they lack of commercial experience and knowledge of marketing. After these areas were identified the focus of technical assistance was broadened. The workshops to develop leadership, to consult on association management tools and fundraising techniques, were immediately included into the list of prospective volunteer assignments upon request of the component. Two workshops on fundraising techniques and a workshop on association management were conducted for associations. Volunteers assisted Russian Far East NTFP Association, Krasnoyarsk NTFP Association, and Region 7 Association with developing fundraising programs.
With association growth the issues of lobbying and advocacy were included on the agenda of activities. Based on the experience of U.S. associations this workshop gave striking examples of how associations may legitimately advocate the interests of their members to legislators and regulators.

When the need for effective presentation skills was identified, the Volunteer Component responded with workshops on how to present a company and products in a market-oriented

fashion. Thirty-four companies attended three trainings and improved their skills in communicating with international donors, government officials and private businesses.

The Volunteer Component responded and focused its assistance at any area that was identified as weak or any challenge that requested assistance. For example, the areas of contractual negotiations and developing effective marketing material were ranked as important for the task of sending delegations to international trade shows. Workshops were conducted involving all the potential delegation members. The participants of Japan trade tour from Sakhalin SWP Association were given training on the trends of Japan wood markets to orient the participants towards possible exports to the Japan market. A U.S. volunteer also consulted on international negotiation and cross-cultural communication skills with the emphases on the specifics of Japan businesses. US volunteers also conducted three workshops for association members on developing effective marketing material. The efforts of volunteers helping with market orientation and material workshops contributed to the success of several contracts.

The orientation obtained during the workshop on trends of Japan market was crucial for *Forest Line*, a member of Japan Trade tour. The company purchased the line on laminated lumber at $134 000. *Forest Line* successfully launched the production of glued lumber and supplied 4000 m3 to Sakhalin shelf for construction sites in 2004.

Strengthening businesses

Volunteer technical assistance focused on strengthening businesses through narrow field workshops and seminars and individual consulting for targeted companies. This included improving or introducing value-added processing, installing new production lines, and improving product quality. Trainings on kiln technology, NTFP organic certification, packaging trends and other areas addressed widespread needs of association members. Narrow field workshops brought new advanced ideas and forced companies to seriously think of value-added manufacturing, increasing profits, adopting new technology and initiating new product lines.

At the workshop on kiln technologies organized at the request of partner associations two national volunteers shared information on kiln technology for Russian species of larch, spruce and pine. As a follow up to the seminar, a national volunteer compiled data on Russian and foreign kiln models. This information sparked tremendous interest with FOREST partners and trade mission participants, who realized that expanding kiln-drying capacity and improving kiln technology, are among the top methods to improve export standards.

Because NTFP buyers in the U.S. and Asia showed increased interest in Russian products, the issues of world packaging standards and organic certification became a priority. Ten Khabarovsk and Krasnoyarsk NTFP companies attended the workshop on world packaging developments and received individual consulting in refining their packaging, labeling and marketing strategies. The U.S. volunteer delivered a workshop on organic certification to clarify organic standards and the organic certification system.

In total 33 workshops and trainings were conducted by U.S. and national volunteers. 620 association members attended these workshops.

Frame Housing Techniques and Intensive Honey Production are examples of two narrow field

workshops conducted by volunteers. The issues delivered at these particular workshops concerned two completely new areas of business for association members.

Individual consulting was focused on business planning. The assignments on business planning were delivered to 11 companies. As a result, five companies launched new production lines. The requests for this kind of assistance were assessed from the point how feasible the opportunities to secure financing were. *Nord Baikal* - new facility to pursue the processing and export of scotch pine to the U.S. and Asia; *Voyage* - new line of glued panels; *Forest Line* - dry kiln installed, lumber gluing equipment purchased, production of construction laminated beams; *Severles* - value added processing of larch and spruce; *Zheleznogosky LPK* - increased volumes (25%) and improved quality.

Improving existing technologies

This area was of great demand and was requested by 30% of project partners. The lack of finance and high interest rate for loans hampered the retooling process. Volunteers recommended and helped to implement modernizing of existing production lines. This led to increased productivity and volumes or considerably improved product quality. Fourteen SWP businesses and 7 NTFP companies improved technology as a result of volunteer assistance. With SWP Hosts volunteers' efforts were focused towards adding value and improving processing, and meeting high grading and kiln-drying standards. Under this assistance *Matur* (increased production capacities by 5 times), *Ecovit* (increased productivity by 20%), *Malakhite* (increased productivity by 25%, quality improved), *Forest Line, Sigma Forest, Lidoga Trading, Commodity Trade Trans, Indigenous Community Amur, Arcada, Zheleznogorsky LPZ* (product quality improved), *Manskaya Dacha* (increased volumes by 80%), *Parusnovsky DOK* (waste reduction by 8%).

Developing new recipes and new products

Two new products: sauce Sakhalinsky and jam, based on Krasnika berry waste were developed by a national volunteer for Chekhov Food Enterprise. Resulting from extracts, the waste made up 40% of processed volumes and originally had no use and was discarded. Two tasty products will be launched in early 2005.

Assistance in developing new recipes and launching new NTFP products was provided through volunteer assistance. In total six companies received assistance of high professionals-volunteers in this area. Thiry-eight new products were developed and production launched.

Forest Products was the first company the Volunteer Program worked with by developing new recipes under the brand name "Vitamishka," (sweet jelly, jam and dessert of wild berry, in total 15 new products). A national volunteer assisted with product launch, developing the marketing and promotion campaign. The company increased production volumes by 79%. *Everest DB* - 5 new recipes of marmalade with wild berry. *Vostokbioproduct* - 8 new herbal teas were developed, *Chekhov Food company* - 2 products based on wild berry wastes. All new products are additive-free and of ecologically pure wild berry extracts.

Marketing assistance

Marketing assistance was provided on marketing strategies, certification procedures, and package design. Two companies, *Fito Cinto,* and *Matur* received certification for their products and increased sales by 10%. To date the Siberian association provides the service and assists its

members in arranging the documents. Thiry-one package designs was developed and refined with the assistance of volunteers. Understanding the role of package and tendency to refine the existing package increased after the US volunteer delivered the workshop on packaging.

Project assessments
Requests for assessing the feasibility of potential projects made up 18% of all the requests for technical assistance. Volunteer experts helped to diagnose the feasibility of an idea or project the company had plans to launch. The assessment of the expert was important for company's final decision. Volunteers provided assistance to ten NTFP companies assessing the opportunities for introducing new technologies and launching new production lines. Nine SWP companies were assisted with kiln feasibilities. In many cases the volunteers pioneered and led the beginning of the process that was further supported through other project activities (workshops, trade shows, study tours) and resulted in success of a partner company.

Assistance to businesses owned by Indigenous people of the Far East
The Volunteer Component provided strong support to the companies owned by Indigenous people or to those companies that involved the Indigenous people into their activity by providing jobs. In most cases these were NTFP processing companies. The indigenous communities were involved in harvesting and initial processing. A series of workshops was provided by national volunteers to 9 Indigenous communities on technology of fern processing and Siberian gingseng. The workshops were focused on sustainable harvesting techniques and processing operations. As a direct result, 238 Indigenous people received seasonal employment.

The assistance to the **Biomass Component** was focused on implementing the task of increasing awareness and interest in the possible use of biomass energy among wood processing companies. Volunteers provided assessments to five companies in Sovetskaya Gavan on kiln feasibility that will operate on wood wastes. This assistance was delivered at the request of Khabarovski Krai Forest Ministry.

Applying for grants and enhancing skills in grant application writing was the volunteer activity with **Grant Component**. A series of workshops on writing strong and competitive grant applications was held and a manual that summarized the information was compiled and distributed among partner associations.

5. Legacy

Results indicated by employment increase, overall improvement, growth and development percentages, numbers and cubic meters have another side that has a long-lasting effect. The impact of volunteer activity is new knowledge transferred, skills obtained by FOREST partners, and new attitudes developed.

As described above, the broad range of volunteer activities and the knowledge disseminated thereby will have long-lasting effects including new attitudes, competence, knowledge on world trends, and enhanced business skills for our partners. Perhaps most importantly, a noticeable shift in mindset was obvious: initially partners focused on the lack of resources but now they see that their ideas can be made a reality. The story of *Forest Line* (Sakhalin) is a striking example of

such a shift in attitude. Harvesting and exporting round logs to Japan was the focus activity of *Forest Line* when the company joined Sakhalin SWP Association and attended kiln seminar organized by FOREST. The seminar encouraged the company Director to acquire a kiln and starting SWP processing. Kiln feasibility was provided by national volunteers and the recommended kiln was purchased at company cost. Kiln operations were launched under volunteer assistance. *Forest Line* started the production of kiln dried lumber and reduced the exports of round logs by 32%. A FOREST trade tour to Japan and the seminar on Trends of the Japan Wood Market conducted by a U.S. volunteer oriented the company towards production of glued construction products. *Forest Line* purchased a laminating line and launched the production of laminated construction beams with volumes 400 m3 a month. This product is of great demand in Sakhalin and *Forest Line* has taken its own niche in Sakhalin wood market fulfilling the year contract of 4000m3 for Sakhalin shelf construction sites. Currently *Forest Line* works on assembling yet another 40 m3 kiln and plans to build a third one to increase the output of kiln dried lumber and laminated construction beams. The current offers from Japan promise a more favorable price and *Forest Line* now has a stable position in the market due to its work with USAID's FOREST Project. On its own initiative *Forest Line* now uses the assistance of one of our former experts – a Winrock International host national volunteer – and they now pay him directly for consulting assistance.

Another example of the Volunteer Component's legacy involves product certification. Once assisted by a national volunteer on procedures in certifying on Conformity of Standards, the Siberian NTFP Association now delivers these services to Association members. A workshop on new advanced trends in processing NTFP conducted by a national volunteer in Sakhalin opened expansion possibilities in the assortment and production of other new NTFP-based products. The workshop aroused the interest and enthusiasm of many companies. At present they directly contact the expert on food technologies in Vladivostok requesting assistance in implementing their projects.

Host national volunteer Evgeny Pirovskikh, an expert on kiln technologies consulted with multiple FOREST partners in improving kiln technology. Knowledge obtained through cooperation with U.S. kiln specialist Mike Sprague during a joint assignment on introducing U.S. kiln technology helped Evgeny to develop a specific approach in kiln technology that includes positives of both Russian and US methods in kiln drying taking into account the specifics of Russian Far East wood. The developed kiln technology found the approval of specialists from Khabarovski Krai Forest Ministry and is now being introduced upon requests from local companies.

These examples highlight the new skills and expanded knowledge wielded by newly trained personnel, determined and enthusiastic to continue the work the FOREST Project began.

6. Lessons Learned and Recommendations

Volunteer technical assistance is often underestimated.

It is a common point of view that only paid consultants can provide strong qualified technical assistance. Often it is thought that because the volunteers are not paid for their assistance, they

take no responsibility for recommendations and do not put much effort in problem solving. This incorrect opinion can and has been changed through strong productive assistance from qualified experts.

Skepticism about U.S. volunteer experts.

Many companies are skeptical that U.S. experts can provide effective technical assistance in the complicated economic climate of Russia and specifically, with the challenges Russian businesses must meet. To combat this skepticism Volunteers could and should be informed of the major trends and developments of the Russian economy during orientation prior to arrival in country.

Unrealistic expectations for the volunteer.

It is a common misconception that the volunteer will give "magic" advice and make a list of recommendations that will improve the situation in the company without any efforts by the Host. Pre-assignment work should be conducted with the Host in this capacity to appropriately prepare them. A potential Host should obtain recommendations on how to effectively prepare. Work together to find solutions – this is the major principle for this form of technical assistance. A Host should also be advised that the volunteer provides recommendations, and efforts are required from the Host to implement the recommendations to gain results in the future.

Wrong concept of technical assistance.

Using technical assistance to improve business and develop was not the tradition in Russia. In fact needing technical assistance was seen as a weakness on the part of the company key staff. Time is required for a new attitude towards technical assistane to take hold. Successes gained through technical assistance should be disseminated to show its value and benefits.

Confidentiality.

Hosts sometimes refused to provide detailed information on their company for SOW development or to share information with a volunteer for fear of violating confidentiality. Lack of detailed information precludes a successful assignment. For this reason it also was difficult to sometimes monitor an assignment by obtaining information on results. However, this is common in Russia and to be expected.

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Lack of access to capital.

Lack of access to capital is the major problem to implementing projects. High interest rates and unfavorable conditions for business development create obstacles totowards results. A number of projects developed by volunteers still are in search of financing.

E. Gender and Minorities

Winrock and its partners ensured benefits of the project would also impact women as well as minority groups. FOREST worked directly with women to enhance their capacity both professionally and socially in the realm of forest fire prevention. The project trained approximately 700 teachers, most of whom were women. These trainings not only provided useful skills but enabled them to network with other teachers in the region. The teachers who attended our programs also trained other teachers on forest fire prevention campaigns. An example of this work was the first Forest Fire Prevention School Age program training in Primorye which took place in Vladivostok on March 19th, 2003, and was led by Elena Yakovleva. In October, 2002 Elena had participated in a training-of-trainers seminar of the Forest Fire Prevention School Age program and was given a draft version of the Program for review, adaptation and implementation. Elena shared her experience with the seminar and ideas on the Program with colleagues from other schools, and worked closely with the Primorski Institute for Rising Skills for Teachers (PIPKRO). The Institute decided to conduct a pilot project using an abbreviated curriculum of the School Age program training and has offered Elena an opportunity to conduct further trainings at the Institute.

Another example is Natalia Gorskikh, Head of the Department of Skill Improvement for Forester Managers for the Divnogorsk Forestry Technical School in Krasnoyarski Krai. Natalia took what she learned at a round of regional foresters' training sessions to her own classroom where she passed her new fire prevention knowledge on to an additional 30 foresters attending a three-week session on forest management. She will continue in this endeavor as professional foresters return to the Divnogorsk Forestry Technical School for skill improvement. Ms. Gorskikh is one of over 70 Krasnoyarski Krai forest professionals who have received fire prevention training through the FOREST Project. We have found that women have been integral to the training process with schools and institutions as they now use these new skills and training to teach practicum students who are training for a career in Forestry Management. FOREST also worked closely with librarians who were mostly women in Khabarovsk krai, Jewish Autonomous Oblast, and Sakhalin Oblast. The primary beneficiaries of our library work were two female directors of the Khabarovski Krai regional library. These women embraced the FOREST methodology and encouraged the spread of communication about forest fire prevention.

FOREST also worked in Pest Monitoring, and Dr. Lubov' Matusevich, the Chief of Division for Forest Protection with the Ministry of Natural Resources (Pest and Diseases Section), led our initiative and was our primary counterpart for the initial four years of the project. Dr. Matusevich held the most senior post in the Division of Forest Protection and directly coordinated with the project. During the final year of the project, another woman Mrs. Irina Makarenkova became the new Director of this area, replacing Dr. Matusevich. Much of the current success of FOREST's work with Pest Monitoring and the current institutionalization progress has been due to both Ms. Matusevich and Ms. Makarenkova, who both sat on the FOREST Project Pest Monitoring Working Group, and as well on the FOREST Advisory Council. Another notable success with reference to our work with women and Pest Monitoring has been the fact that a small, woman-owned company – Print -- in Krasnoyarsk now manufactures pheromone traps for Russia's needs. FOREST institutionalized the development

of the pheromone traps into Russia through a woman-owned firm. Collaboration between the FOREST Project and "Print" has helped the company to improve the quality and durability of the traps while simultaneously lowering production costs by 15%. This new domestic source is attracting attention from agricultural specialists who have also now contacted "Print" to learn more about the possibility of purchasing these pheromone traps. Thus in this endeavor of institutionalization, the FOREST Project has not only ensured there is now a ready supply of low cost pheromone traps for use in Russia, but also that a woman-owned firm is the primary benefactor of this new work.

With reference to Secondary Wood Processing, NTFP (non-timber forest products) and Biomass Energy, not less than 200 senior level women have received direct training in these noted areas during the life of the project. Women were particularly involved in the NTFP activities, which although much weaker than SWP and Biomass Energy, currently represents the promise of new jobs and opportunities for economic growth in the future, most especially for indigenous groups living out in the forest where unemployment exceeds 30% in many cases. While there are fewer women involved in SWP and Biomass technologies, it was noted that there were processor positions held by women in companies such as Dynasty (Khabarovsk), Forest Line (Sakhalin), as well as others. The Biomass Component reports that approximately 70 women, including the Director of Engineering at Eniseyles, head of the business planning center at Energomash, Deputy Director of Operations at Parusnovsky, and the Head of the Corporate Lending Department at Vneshtorgbank benefited from FOREST biomass energy activities. Our Grant Component ensured that grants were only issued to projects that did not discriminate against women; a selection of biomass energy grants also took into consideration involvement of women and minorities in the proposals. And, in an effort to develop capacity, our Volunteer Component provided women volunteers across the FOREST components, resulting in approximately 30% of the 184 volunteers used on the project were indeed women.

A quick glimpse into our work with our Yuzhno-Sakhalinsk representative office provides an excellent indicator of how women – under FOREST – have been plugged into our Secondary Wood Processing, NTFP, and Biomass Components. The Director of FOREST Sakhalin (Vitalina Khristoradova) was a woman who led all initiatives for the project in Yuzhno Sakhalin as well as throughout the island and into the villages. She organized round-tables with the Industry and Trade Committee within the oblast Administration, introduced the various operators of shelf projects to FOREST partner companies and associations, as well as Sakhalin wood processing and biomass companies. In addition due to the meshing of the FOREST components, the work also crossed over into the sphere of fire prevention advocacy since she later coordinated with Sakhalin Energy to receive a grant to support these activities. During the period of the project, Vitalina became viewed not only as a representative of FOREST and Winrock, but also was noted for providing excellent technical assistance by the Sakhalin Oblast Administration under USAID's initiative on the island.

Working with Indigenous tribes is another key point that should be mentioned as well. FOREST also collaborated with the Indigenous Peoples (minority populations) training them on how to get involved advocacy for forest fire prevention, how to use the FOREST manual, and the conducting seminars for NGOs and a large number of public awareness programs in the Nanaisky region. Particularly notable is FOREST's work with assisting in the development of an

Indigenous NTFP Development Center, founded on the basis of FOREST client, Forest Products Company (Khabarovsk). Through FOREST's work with trade missions abroad and in western Russia, we were able to create new opportunities for work of minority populations in NTFPs, which is one of their traditional work areas. To give an example of this work, FOREST utilized two National Volunteers, representatives of the Nanai Indigenous Community, who then developed specialized packaging for herbal teas out of the NTFP birch boxes for a company in the Russian Far East. And it was FOREST work with NTFP companies that indirectly benefited indigenous peoples because as new contracts were awarded to Russian companies in the Russian Far East, this created new seasonal harvesting jobs for indigenous peoples in areas where the unemployment tends to be at its highest rates, within the forested villages.

Truly, it should be noted that the FOREST Project was almost an initiative of women in many ways. For example, the component leader of the Biomass Energy unit, Tatyana Khodos, was a woman and she is well known in Siberia, Russia for her work in this field. As well our Volunteer Component, which utilized both American and host national volunteers, was also managed by a woman, Ms. Lyudmila Khakhaleva. And our Fire Prevention Component over a period of time was managed by two separate women, Ms. Lyudmila Liamets and Ms. Olga Zabubenina. Under our Secondary Wood Processing and Non-timber Forest Products Component, the business trade missions and study tours was managed by both Lydia Volkova and Elena Begunkova, also both women. Indeed the FOREST Project was approximately 80% woman-managed with the Deputy Chief of Party, Ms. Nina Danilyuk, also being a woman. Thus throughout project implementation, women were constantly taken into consideration and it should be noted that the high level of achievement of this project is indeed due to strong knowledgeable women leaders who together implemented FOREST.